

AUBURN UNIVERSITY



Fully accredited by the
Southern Association of Colleges
and Schools

ALABAMA'S
LAND-GRANT
UNIVERSITY

AUBURN, ALABAMA 36830

1972-73

CATALOG NUMBER

Cover by:

CAROYN DAVIS

Auburn University graduate
in Visual Design

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AUBURN UNIVERSITY BULLETIN

Published monthly by Auburn University, Auburn, Ala. 36830. Second-Class postage paid at Auburn, Ala.

VOLUME 67

APRIL, 1972

NUMBER 4

1972

UNIVERSITY CALENDAR

JULY

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1972—Summer Quarter (46 class days) and
Eight-Week Term (36 class days)

- May 23, *Tues.*..... Last day for completing applications for admission
- June 13, *Tues.*..... Final Registration and Schedule Adjustment (p.m.)
- June 14, *Wed.*..... Classes begin
- July 3-4, *Mon.-Tues.*..... Independence Day Holidays
- July 10-14 Registration for Fall Quarter
- July 18, *Tues.*..... Mid-quarter
- August 4, *Fri.*..... Classes end for term
- August 7-8, *Mon.-Tues.*..... Final examinations for term
- August 18, *Fri.*..... Classes end
- August 21-24, *Mon.-Thurs.*..... Final examinations for quarter
- August 25, *Fri.*..... Graduation, 2:30 p.m.

1972—Fall Quarter (49½ class days)

- August 28, *Mon.*..... Last day for completing applications for admission
- September 18, *Mon.*..... Final Registration
- September 19, *Tues.*..... Schedule Adjustment
- September 20, *Wed.*..... Classes begin
- October 24, *Tues.*..... Mid-quarter
- October 23-November 2 Registration for Winter Quarter
- October 24, *Tues.*..... General Faculty Meeting
- November 22-26, *Noon*..... Thanksgiving Holidays
- November 27-December 1, Schedule Distribution and Fee Payment for Winter Quarter
- December 1, *Fri.*..... Classes end
- December 4-7, *Mon.-Thurs.*..... Final examinations
- December 8, *Fri.*..... Graduation, 2:30 p.m.

1973—Winter Quarter (47 class days)

- December 12, *Tues.*..... Last day for completing applications for admission
- January 2, *Tues.*..... Final Registration
- January 3, *Wed.*..... Schedule Adjustment
- January 4, *Thurs.*..... Classes begin
- January 29-February 8 Registration for Spring Quarter

UNIVERSITY CALENDAR

1973

February 7, *Wed.*.....Mid-quarter
 March 5-9, *Mon.-Fri.*.....Schedule Distribution
 and Fee Payment for Spring Quarter
 March 9, *Fri.*.....Classes end
 March 10-14, *Sat.-Wed.*.....Final examinations
 March 15, *Thurs.*.....Graduation, 2:30 p.m.

JANUARY						
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1973—Spring Quarter (47 class days)

March 1, *Thurs.*.....Last day for completing
 applications for admission
 March 22, *Thurs.*.....Final Registration
 March 23, *Fri.*.....Schedule Adjustment
 March 26, *Mon.*.....Classes begin
 April 23-May 3.....Registration for Summer
 or Fall Quarter
 April 24, *Tues.*.....General Faculty Meeting
 April 27, *Fri.*.....Mid-quarter
 May 28-30, *Mon.-Wed.*.....Schedule Distribu-
 tion and Fee Payment for Summer Quarter
 May 29, *Tues.*.....Classes end
 May 31-June 4, *Thurs.-Mon.*.....Final exami-
 nations
 June 5, *Tues.*.....Graduation, 2:30 p.m.

FEBRUARY						
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*1973—Summer Quarter (47 class days) and Eight-Week Term (37 class days)

May 23, *Wed.*.....Last day for completing
 applications for admission
 June 12, *Tues.*.....Registration and Schedule
 Adjustment (p.m.)
 June 13, *Wed.*.....Classes begin
 July 4, *Wed.*.....Independence Day Holiday
 July 9-13.....Registration for Fall Quarter
 July 18, *Wed.*.....Mid-quarter
 August 3, *Fri.*.....Classes end for term
 August 6-7, *Mon.-Tues.*.....Final examinations
 for term
 August 17, *Fri.*.....Classes end for quarter
 August 20-23, *Mon.-Thurs.*.....Final exami-
 nations for quarter
 August 24, *Fri.*.....Graduation, 2:30 p.m.

MAY						
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Note: Schedule distribution and fee payment for the Fall Quarter will be accomplished by mail prior to the opening of the quarter.

*All dates in the Summer Quarter are tentative and are subject to final approval prior to 1973-74 catalog printing.

Board of Trustees

Under the organic and statutory laws of Alabama, Auburn University is governed by a Board of Trustees consisting of one member from each congressional district, as these districts were constituted on January 1, 1961, an extra member from the congressional district in which the institution is located, and the Governor and State Superintendent of Education, who are ex-officio members. The Governor is Chairman. Members of the Board of Trustees are appointed by the Governor by and with the advice and consent of the State Senate and hold office for terms of twelve years. Members of the board receive no compensation. Trustees serve until reappointed or their successors are named.

The Board of Trustees places administrative authority and responsibility in the hands of an administrative officer at Auburn University. The institution is grouped for administrative purposes into divisions, schools, and departments.

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(Ex-Officio) _____ Montgomery
LEROY BROWN, State Superintendent of Education (Ex-Officio) _____ Montgomery

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Class of 1983		
<i>Name</i>	<i>District</i>	<i>Home</i>
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CHARLES M. SMITH, III	<i>Second</i>	Montgomery
VACANT	<i>Eighth</i>	

(One Ex-Officio and non-voting student representative is selected by the Student Senate in compliance with the Governor's Executive Order No. 23 of October 29, 1971.)

FIRST DISTRICT COUNTIES: Choctaw, Clark, Marengo, Mobile, Monroe, Washington and Wilcox.

SECOND DISTRICT COUNTIES: Baldwin, Butler, Conecuh, Covington, Crenshaw, Escambia, Lowndes, Montgomery and Pike.

THIRD DISTRICT COUNTIES: Barbour, Bullock, Coffee, Dale, Geneva, Henry, Houston, Lee, Macon and Russell.

FOURTH DISTRICT COUNTIES: Autauga, Calhoun, Clay, Coosa, Dallas, Elmore, St. Clair and Talladega.

FIFTH DISTRICT COUNTIES: Chambers, Cherokee, Cleburne, DeKalb, Etowah, Marshall, Randolph and Tallapoosa.

SIXTH DISTRICT COUNTIES: Bibb, Chilton, Greene, Hale, Perry, Shelby, Sumter and Tuscaloosa.

SEVENTH DISTRICT COUNTIES: Blount, Cullman, Fayette, Franklin, Lamar, Marion, Pickens, Walker and Winston.

EIGHTH DISTRICT COUNTIES: Colbert, Jackson, Lauderdale, Lawrence, Limestone, Madison and Morgan.

NINTH DISTRICT COUNTY: Jefferson.

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Director of Development

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Director of Agricultural Experiment Station System
Dean of School of Agriculture

WILBUR A. TINCHER, A.B., M.A., Ed.D.
Director of Educational Services

H. FLOYD VALLERY, B.A., M.A., Ed.D.
Assistant to the President

J. HERBERT WHITE, B.S.
Director of University Relations

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The University

HISTORY

Auburn University was established in 1856 as the Methodist-sponsored East Alabama Male College. It opened formally in 1859 with a student body of 80, a faculty of six, and 51 trustees. Men were prepared for the ministry, teaching, and leadership in public life.

Instruction was suspended in 1861 due to the Civil War, resuming in 1866 to continue for six years with inadequate funds. In 1872, through the Morrill Act which provided federal support of land-grant colleges, Auburn undertook its role as Alabama's college for a new type of education "to promote liberal and practical education," and became known as the Agricultural and Mechanical College of Alabama. It was the first college of its kind in the South to be established separate and apart from the state university, and it took an important step by enrolling women in 1892.

Renamed the Alabama Polytechnic Institute in 1899, the college began its challenging road of service to Alabamians, coordinating the old liberal arts with new scientific and vocational aims to find better ways of living and working, interpreting and meeting their needs through a program of Instruction, Research and Extension.

The Agricultural Experiment Station was established in 1887 to stimulate research in agriculture. The Engineering Experiment Station, established in 1929, assists industries in the state, and the Engineering Extension Service was founded in 1937 to render even better service to Alabama. The institution became Auburn University in 1960.

Having occupied temporary quarters since 1969, Auburn University at Montgomery moved to its new 500 acre campus in September of 1971. Auburn University at Montgomery administers the graduate program at Air University, and is developing a continuing education program for the area. Enrollment at Montgomery in the Fall of 1971 was 1,543. This figure, added to the main campus enrollment of 14,503, places the University's total enrollment for 1971-72 at 16,046.

Auburn's multi-million dollar main plant includes 62 major buildings and 27 residence halls on 1,871 acres. The Agricultural Experiment Station System encompasses an additional 16,731 acres throughout the state.

The City of Auburn, 732 feet above sea level, experiences moderate temperatures, has a population of 22,767, and adjoins Opelika, the county seat of Lee County. It is located 60 miles northeast of Montgomery, 120 miles southeast of Birmingham, 125 miles southwest of Atlanta, and 30 miles northwest of Columbus, Ga.

Purposes of Auburn University

Auburn's responsibility as a University is to maintain an environment of learning in which the individual and society are enriched by the preservation, transmission, and creation of knowledge. This obligation embraces Auburn's continuing commitment to its land-grant traditions as well as its consciousness of evolvement into a dynamic and complex institution whose programs of instruction, research and extension must be ever pertinent to the needs of a changing social order.

Auburn University, therefore, is dedicated to these purposes:

Providing for its students, within the resources of the institution, educational opportunities of a liberal character as well as those of a specialized nature;

Developing graduates whose knowledge, intellectual discipline, and awareness of the morality of individual action will be manifest in service to their fellow man and to the state and nation;

Conducting a broad program of faculty, undergraduate and graduate research, both basic and applied, to stimulate the faculty and students in their quest for knowledge, to promote their intellectual growth and development, to broaden the foundations of knowledge, to increase understanding of today's and tomorrow's world, and to aid society in resolving its scientific, technological and social problems;

Creating and implementing effective programs of education and service which will extend the scientific and cultural resources of the University to individuals, communities, institutions, and industries, thereby contributing to an improved technology, better environmental and health conditions, enhancement of the general level of living, and the development of more responsible citizenship;

Encouraging scholarly and creative effort in the arts, humanities, and sciences so that the University may serve its students and the community at large as a vital source of cultural enlightenment and as a stimulus toward their participation in the intellectual life; and

Reassessing continuously the value of particular objectives and programs of the University in order to make them accord with new knowledge and changing social conditions; and as a part of this reassessment to seek ever more efficient and imaginative means of fulfilling the University's purposes.

Functions

The official seal of Auburn University carries three words, Instruction, Research, and Extension, indicating the three functional areas through which the institution operates as the State's Land-Grant University.

Instruction

The University's instructional purpose is twofold: to stimulate the student to reach his full potential as a human being through a respect for intellectual

inquiry and an understanding of the cultural tradition of which he is a part; and to provide him with the knowledge and skills that will allow him to make his way successfully in a demanding and practical world.

The undergraduate curriculum at Auburn University is therefore conceived as a process wherein general and specialized studies are harmonized to produce a graduate (a) who has pursued one study area in depth (conventionally, the departmental major) for vocational or professional ends; but (b) who has also undergone intellectual experiences in representative academic disciplines: mathematics and the natural sciences, the humanities, and the social sciences.

Thus each student at Auburn University must complete, in addition to the "depth" requirements of his specialized area, a program of liberal education studies comprising approximately 25 percent of the total number of hours in his bachelor's degree program. The minimal University liberal education program is described in detail on page 65.

The baccalaureate degree is offered by the nine undergraduate academic schools incorporated in Auburn University, including 63 departments for specialized study. Master's and doctoral degrees are offered through the Graduate School. Military instruction is offered through programs in Air, Military, and Naval Science.

Research

The land-grant college upon its inception accepted responsibility for discovering and organizing knowledge in agriculture and related fields largely because of lack of subject matter for instruction.

The purposes of research suggested in the Hatch Act of 1887 provided for establishment and support of the Agricultural Experiment Station. Its objectives were to conduct research bearing on the agricultural industry, to aid in acquiring information on subjects connected with agriculture, and to promote scientific investigation into the principles and applications of agriculture.

In 1929 the Engineering Experiment Station was established to assist industries in the State to improve manufacturing processes and to study undeveloped natural resources and methods by which they may be converted into marketable products. Its services are available to industry, governmental agencies, and to citizens of the State.

In 1944 a Research Council was formed to further research, to discover and develop research talent, to cooperate with all agencies for the betterment of the South, to foster and encourage learning in natural science, social science, the humanities, agriculture and engineering, and to promote liberal and practical education in the several pursuits of life.

The Water Resources Research Institute was established in 1963 to stimulate and sponsor water resources research and the training of scientists in water and other resources as they affect water.

The Nuclear Science Center was completed in 1967. This facility provides research and teaching space for use by all departments for work in all phases of the pure and applied aspects of the nuclear science field. Work is being done in the areas of agriculture, chemistry, engineering, home economics, pharmacy, physics and veterinary medicine.

In 1967 the Office of Contract and Grant Development was established within the Office of the Vice President for Research to coordinate and service University policies and procedures relating to extramural programs in instruction, research, and extension, and to handle the activities formerly handled by the Auburn Research Foundation. Auburn's fastest expanding research area is sponsored research — contract and grant research supported by Federal, State, Foundation, and private agencies in all units of the institution.

The continuing objectives of the University are to further the frontiers of knowledge in all areas and to discover new and better ways of doing things through broadened programs of research.

Every academic school on the Auburn campus is involved in research. Auburn's faculty and graduate students are actively increasing man's understanding of man and the world in which he lives. In the sciences, the quest is for new knowledge. In the arts, humanities, and social sciences, the search is for new meanings.

While University interests are in applying scientific study and findings to current problems, equal interests exist in preparing scholars, thinkers, and workers for the future, and leaders competent in the use of the fruits of research.

The growth and development of University research parallels that of graduate enrollment. Individual research by faculty members and graduate students is encouraged and extensive programs of basic and applied research are continually expanding throughout the institution.

Extension

The development and implementation of extension programs is one of Auburn University's major responsibilities. Programs are designed to enable the University to provide a wide variety of educational services to farms, homes, industries, communities, and municipalities throughout Alabama. Over the years, Auburn University, by lectures, publications, demonstrations, and other educational methods, has extended the results of research and instruction and countless other services to the people of Alabama.

The Cooperative Extension Service is the oldest of the formally organized Extension Services at Auburn University. It was created by the Smith-Lever Act passed by the National Congress in 1914. Educational programs implemented by the Cooperative Extension Service are conducted in accordance with a Memorandum of Understanding between Auburn University and the United States Department of Agriculture. Programs in each of the 67 Alabama counties are conducted under a Memorandum of Understanding between Auburn University and the county governing body.

Cooperative Extension Service programs are organized broadly around agriculture, marketing, home economics, youth activities, community improvement and resource development.

The Engineering Extension Service was established in 1937 to implement educational programs developed in the School of Engineering and to provide educational services which would more adequately meet the needs of industries in the state. Programs of this service include short courses, conferences, work-

shops, and other methods of extending technical assistance to Alabama industries.

Extension programs are also conducted through the Extension Division by the Schools of Architecture and Fine Arts, Arts and Sciences, Business, Education, Pharmacy, and Veterinary Medicine. In addition, Educational Television presents public service programs, and the Ralph Brown Draughon Library works cooperatively with city, county and regional libraries to make literary materials available to people throughout the State.

In all of its extension and service programs, Auburn University continuously strives to serve the people, communities, and industries of Alabama more adequately by relating its competencies to their needs.

The Academic Program

Fields Of Study

Auburn University offers work in many fields. The student has an opportunity for specialization and the pursuit of particular interests in the several Schools including the Graduate School.

For instructional purposes, the University is organized into the following Schools: Agriculture, Architecture and Fine Arts, Arts and Sciences, Business, Education, Engineering, Home Economics, Pharmacy, Veterinary Medicine, and the Graduate School.

Instruction is given in each School through four quarters of approximately 11 weeks each.

Resident instruction in the University is offered through Schools and Departments as indicated below. Regular curricula offered and degrees conferred by the several Schools are also listed.

School of Agriculture, includes the Departments of Agricultural Economics and Rural Sociology, Agricultural Engineering, Agronomy and Soils, Animal and Dairy Sciences, Botany and Microbiology, Fisheries and Allied Aquacultures, Forestry, Horticulture, Poultry Science, and Zoology-Entomology. Curricula offered are: *Agricultural Science, Agricultural Business and Economics, Agricultural Engineering, Biological Sciences, Food Science, Forest Management, Landscape and Ornamental Horticulture, and Wood Technology*. Within each curriculum students are permitted to major in line with their special interests.

Degrees: Bachelor of Science in Agricultural Science, Agricultural Business and Economics, Agricultural Engineering, Biological Sciences (Botany, Entomology, Fisheries Management, Marine Biology, Microbiology, Wildlife Management, Zoology), Food Science, Forestry, Landscape and Ornamental Horticulture, and Wood Technology.

School of Architecture and Fine Arts, includes the Departments of Architecture, Art, Building Technology, Music, and Theatre. Curricula offered are: *Architecture, Building Construction, Fine Arts, Industrial Design, Interior*

Design, Music (Majors in Applied Music, Church Music, Music History and Literature, Theory and Composition) Theatre, and Visual Design.

Degrees: Bachelor of Architecture, Arts, Building Construction, Fine Arts, Industrial Design, Interior Design, Music.

School of Arts and Sciences, includes the Departments of Chemistry, English, Foreign Languages, Geology, History, Mathematics, Philosophy, Political Science, Physics, Psychology, Sociology, and Speech Communication. Curricula offered are: *The General Curriculum (Majors in 17 subject matter fields in the Humanities and Natural and Social Sciences)*, the *Pre-Professional curricula (Pre-Law, Pre-Dentistry, Pre-Medicine, Pre-Optometry, Pre-Hospital Administration, Pre-Occupational Therapy, Pre-Physical Therapy, Pre-Pharmacy, and Pre-Veterinary Medicine)*, and *Special curricula (Chemistry, Geology, Laboratory Technology, Law Enforcement, Mathematics, Physics, Applied Physics, and Public Administration)*.

Degrees: Bachelor of Arts and Bachelor of Science.

School of Business, includes Departments of Accounting and Finance, Economics and Geography, Management, and Marketing and Transportation.

Degree: Bachelor of Science in Business Administration.

School of Education, includes the Departments of Administration and Supervision; Counselor Education; Educational Media; Elementary Education; Foundations of Education; Health, Physical Education and Recreation; Secondary Education; and Vocational and Adult Education. Undergraduate curricula offered are: *Elementary Education, including Early Childhood Education and Special Education (Mental Retardation)*, *Health, Physical Education and Recreation Administration*; *Secondary Education with majors or minors in Art; English; Health Education; Mathematics; Foreign Language; Music; Science; Social Science; Speech; Speech Pathology; and Theatre*; and *Vocational and Adult Education with majors in Adult Education; Agricultural Education; Basic Vocational Education; Business Education; Distributive Education; Home Economics Education; Industrial Arts; Rehabilitation Services; and Trades and Industrial Education*.

Degree: Bachelor of Science in Education.

School of Engineering, includes the Departments of Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Technical Services, Industrial Engineering, Mechanical Engineering, Textile Engineering, and a Pre-Engineering program for entering freshmen engineering students. This School offers curricula in *Aerospace Engineering, Aviation Management, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering, Materials Engineering, Textile Chemistry, Textile Engineering, and Textile Management*.

Degrees: Bachelor of Aerospace Engineering, Aviation Management, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering, Materials Engineering, Textile Chemistry, Textile Engineering, and Textile Management.

School of Home Economics, includes the Departments of Consumer Affairs, Family and Child Development, and Nutrition and Foods. This school offers

curricula in *Clothing, Textiles and Related Art with options in Textile Design, Textile Science, and Clothing; Fashion Merchandising; Housing, Interior Furnishings & Equipment, with options in Interior Furnishings and Household Equipment; Family & Child Development with options in General Family and Child Development and Maternal and Child Health; Home Management and Family Economics; Family & Child Services; Institution Food Management; Nutrition & Foods; and Pre-Nursing Science.*

Degree: Bachelor of Science.

School of Pharmacy, includes the areas of Pharmacy, Pharmaceutical Chemistry, Pharmacology, Pharmacognosy, and Pharmacy Administration.

Degree: Bachelor of Science in Pharmacy.

School of Veterinary Medicine, includes the Departments of Anatomy and Histology, Microbiology, Pathology and Parasitology, Physiology and Pharmacology, Large Animal Surgery and Medicine, and Small Animal Surgery and Medicine, and Radiology Section, and offers a curriculum in *Veterinary Medicine.*

Degree: Doctor of Veterinary Medicine.

The Graduate School, administers programs leading to the degrees of Master of Arts, Master of Science, Master of Agriculture, Master of Arts in College Teaching, Master of Fine Arts, Master of Business, Master of Education, Master of Electrical Engineering, Master of Industrial Design, Master of Music, and Master of Regional and Urban Planning. Beyond the Master's degree, programs are offered leading to the degrees of Specialist in Education, Doctor of Education, and Doctor of Philosophy.

Reserve Officers Training Corps: Army, Navy, and Air Force Departments.

The Campus and Buildings

Located on the Auburn campus are 62 major classroom, research, and service buildings. There are 24 women's dormitories; two men's dormitories, an athletic dormitory and 384 apartments for married students in the Caroline Draughton Village. The main campus consists of 1,871 acres.

The Auburn Memorial Coliseum was completed and occupied in January, 1969. The arena seats 13,000, and it has stage facilities for conversion to auditorium use. It is occupied and used jointly by the Athletic Department and the Physical Education Department. The coliseum also has an auxiliary gymnasium and a swimming pool.

Haley Center, a 10-story classroom and office building, was completed and occupied in the summer of 1969. Primary use of the Center is assigned the School of Arts and Sciences and the School of Education.

The Small Animal Clinic moved into new facilities adjoining the Large Animal Clinic in the Fall of 1970. The rest of the School of Veterinary Medicine moved into new facilities in the same area in the Winter of 1971. These facilities cost approximately \$5,000,000 and were financed from State Bond Issue, Government Grant and Auburn University Development Program Funds.

Through the Auburn University Development Program, a new organization enabling Auburn alumni and friends to support the University, funds for the construction of a Nuclear Science Center were made available. A \$1,400,000 Nuclear Science Center is now in use.

Construction of a new Theatre for the Theatre Department and of a new Fisheries Building is scheduled for completion by the beginning of the Fall Quarter of 1972. Each of these buildings is financed from a one million dollar State Bond issue allocation plus Auburn University Development funds.

Direction of the Auburn University Development Program is under a 55-member board known as the Auburn University Development Council. All gifts obtained through the Development Program are received by the Auburn University Foundation, a corporation created expressly for that purpose and administered by a seven-man board of directors.

Experiment Station Properties

The Agricultural Experiment Station System of Auburn University owns 16,731 acres of land at the ten substations, four experiment fields, four forestry units, plant breeding unit, ornamental horticulture field station, foundation seed stocks farm, and the main station at Auburn. Locations and acreages of the above mentioned units are as follows:

Main Station	Auburn	Lee	4,453
Substations:			
Black Belt	Marion Junction	Dallas	1,116
Chilton Area Horticulture	Clanton	Chilton	161
Gulf Coast	Fairhope	Baldwin	800
Lower Coastal Plain	Camden	Wilcox	2,755
North Alabama Horticulture	Cullman	Cullman	160
Piedmont	Camp Hill	Tallapoosa	1,409
Sand Mountain	Crossville	DeKalb	536
Tennessee Valley	Belle Mina	Limestone	760
Upper Coastal Plain	Winfield	Marion and Fayette	735
Wiregrass	Headland	Henry	532
Experiment Fields:			
Brewton	Brewton	Escambia	80
Monroeville	Monroeville	Monroe	79
Prattville	Prattville	Autauga	80
Tuskegee	Tuskegee	Macon	237
Plant Breeding Unit	Tallassee	Elmore	664
Ornamental Horticulture			
Field Station	Spring Hill	Mobile	22
Foundation Seed Stocks Farm	Thorsby	Chilton	180

In addition to the above, there are 1,972 acres at the Forestry Units in Autauga, Barbour, Coosa, and Fayette Counties.

Library Facilities

The Ralph Brown Draughon Library, opened in January, 1963, has a study capacity for 2,000 students and room for one million volumes. Spacious reading rooms are separated by glass walls, giving a panoramic view of each floor, with fluorescent lights, contemporary furniture, and open book stacks aiding the student in his study.

The Library also contains 98 closed carrels for the use of faculty members and graduate students engaged in library research, seven rooms for listening to recordings and a projection room with 108 theatre seats where special educational films may be viewed. The building is completely air-conditioned and has public elevators for use of patrons.

On July 1, 1971, the Library contained 757,148 volumes and more than 500,000 publications of federal and state governments. Materials issued by the various branches of the federal government, the Atomic Energy Commission, and the National Aeronautics and Space Administration and others are received. The collections in microphotographic reproduction are being increased rapidly. Each floor or division has one or more special reading rooms for various microforms.

Agricultural and engineering experiment station bulletins and others are available. Quantities of books, dissertations, and documents are received on microfilm and microcards, as well as important newspapers and periodicals. More than 10,000 serials are being received as of July 1, 1971; back files are available for a large portion of these titles.

A number of special collections are maintained by the Library. Some of these are the George Petrie Memorial Collection, presented by Miss Kate Lane; the Flagg Architecture Library, given by the Alabama Institute of Architects; the Hodson Collection on the History of Agriculture, presented by Mr. Edgar A. Hodson, Arkansas State Agronomist; the personal library of the late Mrs. B. B. Ross; an excellent sports collection, donated by Mr. C. W. (Bill) Streit; and many others. The Library also contains a collection of documents and publications in Alabama history and government.

Borrowing privileges are extended to the members of the administrative, research, instruction, and extension staffs of the University; to University alumni and to governmental departments and agencies located in Auburn. Loan privileges are also extended to all citizens of the State by inter-library loan requests through their local libraries; to all students in residence; and to members of the Auburn Research Foundation.

Books for reserve use by the various classes are located in the Reserve Book Department on the first level. Here also are a large reserve reading room, a general reading room, the Special Collections Department, a projection room and a browsing room on this floor. Popular and contemporary books, magazines and newspapers are available here. Housed on the second floor are the Humanities Division, the bibliography area, the Technical Services area, the Circulation Division, and the Administrative Offices. The third floor is devoted entirely to the Social Sciences, and the fourth floor to Science and Technology.

Branch libraries on campus are the Architecture Library and the Veterinary Medical Library. Hours of service vary in the branch libraries.

The Department of Archives, located on the first floor, accumulates and makes available the University archives, manuscripts, letters, notebooks, articles, papers, and other materials of or by the various staffs of the institution; also similar materials dealing with the State of Alabama and the South in general. The Department is not open all hours the Library is open; patrons and visitors may call the Department for information, Ph. 826-4465.

Sources of Revenue

Auburn University derives its support from the State and Federal Governments and from other sources. Funds are as follows:

1. Direct annual appropriations made by the State for support, maintenance, and development of public education, including campus instruction, agricultural research, agricultural extension, engineering research, and educational television.
2. Special appropriations made by the State for buildings, purchase of lands, and improvements.
3. Funds derived from the original endowment of the institution under the Federal Land-Grant Act and earnings from other subsequently acquired endowment funds.
4. Income derived from the payment by students of fees and other charges. All tuition at Auburn University is free, except to non-residents of Alabama, but certain fees are assessed to cover specific services.
5. The Morrill fund appropriated by the United States Government for the instruction of students in the sciences relating to agriculture and the mechanic arts and in the English language, literature, and for the training of teachers in agriculture and the mechanic arts.
6. Funds received from the State of Alabama through the Smith-Hughes Act derived from the congressional appropriation and paid to Auburn University for its work in the training of teachers of agriculture and home economics.
7. Such revolving funds as may be incident to the operation of any department where it is advisable to sell or dispose of products produced in the course of conducting the Agricultural Experiment Station or any other unit of the institution.
8. Gifts, grants, and donations received from alumni, private individuals, and organizations both for general and restricted educational purposes, including scholarships.
9. Direct annual appropriations made by the United States Government for research purposes and devoted to investigation of scientific agricultural problems. These funds are also for research purposes in connection with investigation of new experiments bearing directly on the production, manufacture, preparation, use, distribution, and marketing of agricultural products, and research work regarding Home Economics, and for the purpose of publishing these results.

10. Direct appropriations made by the United States Government for the Cooperative Extension Service in support of County Agricultural and Extension Home Agents, for the support of boys' and girls' 4-H club work, and for other types of extension work in agriculture and home economics in the several counties of Alabama.
11. Each county in the State makes certain appropriations to supplement those from the United States Government and the State of Alabama for the support of the Cooperative Extension Service.
12. Funds received from industry, governmental agencies, and private individuals for special contractual research projects which are handled through the Office of Contract and Grant Development by organized research units and/or in appropriate academic schools.

For Prospective Students

Admissions

General Admissions Information

Preference is given to the admission of residents of the State of Alabama; in considering applicants for admission to professional schools or other programs with restrictive admissions policies, the length of residency in the State of Alabama shall be a factor.

Applications from out-of-state residents will be accepted for all curricula except Pre-Veterinary Medicine. However, the number of out-of-state students who are accepted will be determined by the availability of facilities and faculty.

Application Instructions

Application for admission to any undergraduate school or curriculum of the University must be made to the Admissions Office, Auburn University, Auburn, Alabama 36830. The necessary application forms and specific instructions may be obtained from the Admissions Office.

Students may apply for admission to any quarter of a given calendar year as early as October 1 of the preceding year. Because of the large number of applications, credentials should be filed at the earliest possible time. In every case, complete admission credentials, including the physical examination report, must be filed at least three weeks prior to the opening of the quarter in which admission is desired. The University reserves the right, however, to establish earlier deadlines should the number of applicants exceed the number of students who can be adequately housed or instructed.

A ten dollar (\$10.00) application processing fee must accompany all applications for admission. This fee is required for all undergraduate applications and is not refundable or applicable to registration or tuition fees. In submitting admission credentials, applicants must give complete and accurate information. False or misleading statements can result in denial of admission or cancellation of registration.

A provisional notice of acceptance may be issued after submission of only the application form (including the optical scanner sheet properly completed) and up-to-date academic documents, but each applicant must complete and return, at least three weeks prior to the opening date of the quarter in which admission is desired, a medical examination report on a form which will be furnished by the University. The University reserves the right to require any student to submit to such additional medical examinations as are believed advisable for the protection of the University community, and to refuse admis-

sion to any applicant whose health record indicates a condition which college work would affect adversely or which would be harmful to the students of the University. Any applicant who fails to comply with this requirement will not be admitted to the University.

Each applicant must furnish satisfactory evidence of good character. It is the University's policy to refuse admission to persons whose presence in the student body of the institution is deemed by the authorities to be detrimental to the best interest of the institution or its students.

Applicants may be admitted to most undergraduate curricula in any quarter; however, to Veterinary Medicine, they may be admitted in the Fall Quarter only. For additional information about admission to Veterinary Medicine, see page 198.

Pre-College Counseling Program

As a means of helping entering freshmen and transfer students to make wiser decisions in choosing their field of study and to adjust more readily to their first quarter of college life, Auburn University has instituted the Pre-College Counseling Program.

Summer program for fall quarter freshmen — The summer program for freshmen entering the fall quarter consists of a series of sessions on campus. During these sessions students talk with trained counselors and are given the opportunity to plan, with advisers, a schedule for their first quarter of college work.

Program for freshmen entering winter, spring, or summer quarters — Students entering Auburn University as first quarter freshmen for any quarter, other than the fall quarter, are usually required to report to campus one day early for counseling activities.

Program for transfer students — Transfer students are given the opportunity to meet with advisers during the regular pre-registration period preceding the quarter in which they plan to enroll. At this time they will have their transcripts evaluated and plan their schedules for the following quarter. There is a convocation for all transfer students which is usually held on the first day of registration prior to the beginning of classes.

Admission To Freshman Class

Standard Admission

Commensurate with available faculty and facilities, favorable consideration for admission will be given to graduates of accredited secondary schools whose college ability test scores and high school grades indicate they can be successful in fields of study in which they seek enrollment.

Although the University makes few stipulations about definite high school courses, all students planning to apply for admission should emphasize in their programs the following subjects: English, mathematics, social studies, sciences, and foreign languages. A minimum of 16 high school units is required for admission. Four of these units may be vocational subjects.

Students applying for admission to the professional curricula in architecture and interior design will be required to make a satisfactory score on the Architectural School Aptitude Test. Application for this test must be made to the Educational Testing Service, P.O. Box 592, Princeton, N. J. 98540. Tests are given on certain dates at the Auburn campus as well as at other university and college campuses throughout the United States.

Alabama residents are required to complete the American College Test (ACT) on one of the announced national testing dates. Either the ACT or the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board will be accepted for applicants from states other than Alabama. High school students may secure application forms and information regarding the tests from their principals or counselors. Scores attained on these tests are used as a partial basis for admission, for placement in English, chemistry, and mathematics, and for awarding university-administered scholarships and loans.

At least one unit of college preparatory mathematics (geometry or algebra) is required for admission to any curriculum. Curricula which list the course MH 159 or the course MH 160 presuppose a competence in the mathematics commonly taught in high school geometry and second-year algebra; and curricula which list MH 161 as a first course in mathematics presuppose, in addition, competence in high school "analysis" (specifically, the function concept, graphs of functions, the trigonometric functions). A deficiency in this latter material can be made up by taking the course MH 160 at Auburn. Auburn University offers no course comparable to high school geometry or to first and second year high school algebra.

Applicants of mature age who have not graduated from high school may be considered for freshman admission if scores made on the USAFI General Educational Development Test, the American College Test and/or such special achievement tests or subject examinations as may be recommended by the Committee on Admissions, indicate educational attainment equivalent to graduation from high school. Applicants from non-accredited high schools will be considered for admission on an individual basis by the Committee on Admissions.

Early Admission

Students of high academic promise may be admitted directly from the eleventh year of school without the secondary school diploma. Basic requirements for early admission are:

1. Proper personal qualifications.
2. Superior competence and preparation as evidenced by the high school record, and by excellent scores on pre-admission aptitude tests, College Entrance Examination Board achievement tests in English, mathematics, and history or a science, pre-registration placement tests, or proficiency tests administered by appropriate departments at Auburn University.
3. A letter from the principal recommending the applicant as to emotional and social maturity and readiness for college work.

Details of procedure for consideration of early admission can be obtained from the Admissions Office.

Advanced Standing Program

Under the Advanced Standing Program, able students of superior preparation are afforded the opportunity of being placed in programs suited to their abilities and preparation for college study. Some exceptionally able students may be admitted prior to high school graduation. (See "Early Admission.") High school graduates of superior achievement may be able to qualify for advanced placement and for credit which may count toward degree requirements.

Advanced Placement — Entering freshmen who demonstrate superior preparation are accorded the opportunity of qualifying for advanced placement and/or credit, not to exceed a total of 45 quarter hours, in the following areas: Biology, Botany, Chemistry, English, Foreign Language, History, Mathematics, Physics and Zoology.

Advanced placement or credit may be granted to entering freshmen who during their senior year in high school have made satisfactory scores on the College Board Advanced Placement Examinations.

A student with special competence in a specific area, as evidenced by high school grades and scores on college ability or achievement tests, may apply for a departmental examination which may qualify him for advanced placement or credit in that department.

The amount of credit allowable through advanced placement is determined by the dean and the department head concerned. A brochure describing the Advanced Standing Program will be forwarded by the Office of High School Relations upon request.

Proficiency Examinations — Proficiency Examinations similar to final examinations may be administered by a department upon application of the individual student. A student who has pursued college-level work in secondary school, in class or on a tutorial basis, or through private study, may make application for a proficiency examination. If he earns a satisfactory grade, he will be eligible for placement in an advanced course and for credit in the subject covered by the examination.

Admission Of Transfer Students

An applicant who was not eligible for admission to the University upon graduation from high school must present a minimum of 96 quarter hours or 64 semester hours of college work attempted in order to be considered for admission as a transfer student.

For residents of Alabama or other states party to the Southern Regional Education Board, a satisfactory citizenship record, an overall average of "C" or better on all college work attempted,* and eligibility to re-enter the last institution attended are required for transfer admission. For residents of other states, in addition to the other two stipulations, an overall "B" average on all college work attempted is required. Entrance examinations may be required of applicants transferring from colleges with which the University has had little or no experience.

*When computing the overall grade average, Auburn University uses the 3.0 system and counts all grades earned, including those earned in courses which were later repeated.

Graduation from a junior college does not of itself assure an applicant of admission to Auburn. Such applicants must also present an overall average of "C" or better on all work attempted. The maximum credit allowed for work done in a junior college will not exceed the number of hours required in the first two years of the student's curriculum at Auburn.

Each applicant must submit two official transcripts of his record from each institution attended. Applicants who will not have completed 96 quarter hours or 64 semester hours prior to the quarter in which admission is desired, must submit one transcript of his high school record.

Acceptance of Transfer Credit — The amount of transfer credit and advanced standing allowed will be determined by the appropriate dean and the Registrar. Acceptance of "D" grades is determined by the dean, except that credit is allowed in Freshman English only on grades of "C" or better. See page 58.

Students transferring from institutions not fully accredited by the appropriate regional agency may be granted provisional credit. When provisional credit is allowed, the final amount of credit will be determined after the student has completed one year of course work (credit hours and residence quarters) at Auburn University. If a "C" average is not achieved, the amount of credit will be reduced in proportion to the number of hours in which a "C" or higher grade is not earned.

A student who has completed course work at an accredited college prior to his graduation from secondary school can transfer full credit provided: (1) the college credits are not used as secondary school graduation requirements, (2) the student has a "C" average on the courses transferred, and (3) the credits would normally be accepted in the curriculum of his choice. If the college credits are used to meet the student's secondary school graduation requirements, he may apply for credit through advanced placement or a departmental proficiency examination. The department head and the student's dean will determine the appropriate action.

Transfer Within the University System

Auburn University is composed of two campuses—Auburn and Montgomery. A student enrolled in an undergraduate division at either campus who wishes to transfer to an undergraduate division at the other will be considered for admission as a transfer student from another accredited institution. Due to the small difference in some curricula and courses, the amount of transfer credit and advanced standing will be determined by the appropriate academic unit and the Registrar at the campus to which he transfers.

Admission Of Transient Students

A student in good standing in an accredited college or university may be admitted to Auburn University as a transient student when available faculty and facilities permit.

To be eligible for consideration for admission, a transient student applicant must submit a satisfactory medical report and the Transient Student Form (in duplicate) properly completed and signed by the Dean or Registrar of the

college or university in which he is currently enrolled.

Permission to enroll in courses on a transient basis is granted for one quarter only, and a student who wishes to seek re-entry in the transient classification must submit another Transient Student Form. It must be understood that transient student permission does not constitute admission or formal matriculation as a regularly enrolled student (degree candidate); however, a transient student is subject to the same fees and regulations as a regular student, except that physical education, and academic continuation in residence requirements shall not apply.

It is the responsibility of the transient student to check with the academic department offering the courses in which the student wishes to enroll to determine if he has met course prerequisites and if he has the necessary preparation to take the courses desired.

If at any time a transient student desires to enroll as a regular student, he must make formal application for admission to the University as a transfer student and submit two complete transcripts from each college or university attended.

Admission Of Unclassified Students

For residents of Alabama and other states party to the Southern Regional Education Board, admission to undergraduate programs as an Unclassified Student may be granted on the basis of a baccalaureate degree from an accredited senior college or university. For residents of other states, Unclassified Student admission may be granted on the basis of the baccalaureate degree and an overall "B" average. Students desiring to enroll in this classification must submit the same admission credentials as transfer applicants.

Admission Of Special Students

Persons who cannot fulfill the regular admission requirements for freshman standing but otherwise have acquired adequate preparation for university courses may be admitted as special students on approval of the Committee on Admissions and the dean concerned. Course credits earned by special students generally cannot be used as credit toward a degree at Auburn University.

To change from one campus of the University to the other, special students must obtain permission of the Admissions Committee on the campus to which they wish to transfer.

Admission Of International Students

The University welcomes admission inquiries from international students. However, due to limited facilities, only those students who are academically strong will be given serious admissions consideration. In addition to being academically strong, an international student should be proficient in English. In all cases, English proficiency is determined by the student's submitting satisfactory results on the Test of English as a Foreign Language (TOEFL), offered by the Educational Testing Service, Box 899, Princeton, New Jersey,

U.S.A. 08540. The student must submit satisfactory results on the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board which is also offered by the Educational Testing Service.

A prospective international student should initially send all of his academic credentials to the Admissions Office for an evaluation. If the prospective student appears to be academically qualified for admission and shows promise of success in his chosen field of study, he then will be asked to make formal application. The formal application must be accompanied by a recent photograph and a non-refundable U.S. \$10.00 application fee. If the applicant presents satisfactory TOEFL results and evidence that he has sufficient funds to pay for his college expenses (there is no form of financial assistance for undergraduate international students), he will be sent an acceptance and the form I-20 which is the authorization for a student visa. For additional information prospective international students should contact the Admissions Office, Auburn University, Auburn, Alabama, U.S.A. 36830.

Admission Of Auditors

When available faculty and facilities permit, a person not desiring admission for course credit may be allowed to audit a lecture course or the lecture part of a combined lecture and laboratory course with the approval of the Admissions Office, the student's dean, and the head of the department in which the course is offered. A formal application for admission must be filed, but the \$10.00 application processing fee and the physical examination report are not required. (See Auditing Privilege, page 51.)

Admission To Graduate Standing

Admission to graduate standing is granted only by the Graduate School of the University. Graduation with a Bachelor's degree or its equivalent from an accredited college or university plus submission of satisfactory scores on the Aptitude Test of the Graduate Record Examinations are requisite for admission to the Graduate School. The undergraduate preparation of each applicant for admission must also satisfy the requirements of a screening committee of the school or department in which he desires to major. Any student in good standing in any recognized graduate school who wishes to enroll in the summer session, in an off-campus workshop or in a short session and who plans to return to his former college may be admitted as a "graduate transient." For further information see section on The Graduate School and contact the Graduate School for a special catalog.

Re-admission Of Former Students

Students who have attended Auburn University and desire to re-enter must secure a registration permit from the Registrar's Office. Students who have attended another institution for one (1) quarter or semester must be eligible to re-enter the institution attended. Students attending another institution for more than one (1) quarter or semester must also have earned at other institutions attended an overall average of "C" or better to be eligible to re-enter

Auburn University. Two (2) transcripts must be furnished the Registrar's Office from the institution attended.

Living Accommodations

There is general agreement that a university education is not limited to classroom activities. Desirably, important supplementary benefits are derived from the experience of living within an educational environment. The minimal housing requirements should be that accommodations are comfortable and healthful and that surroundings are conducive to study. The proper living conditions will help students to do better in their studies and can provide opportunities for personal and social growth.

The university reserves the right to enter rooms for inspection purposes. If the administration deems it necessary, the room may be searched and the occupant required to open his personal baggage and any other personal materials which are sealed.

Men Students

Auburn University has dormitory accommodations for approximately 1,100 men students. The men's dormitories are in two areas, Magnolia and Sewell Dormitories.

Magnolia Dormitories consist of Magnolia and Bullard Halls. Together they provide housing for 931 men. The buildings are of brick, hollow tile, and steel construction and have recently been renovated. They are located on the northwestern part of the campus with structures interconnected to form a harmonious architectural and living pattern. The units are arranged into divisions of approximately 40 students. These divisions, wherein residents share the experiences of living and working together, form the nucleus of the dormitory program. There is a resident adviser in each division. Resident advisers are assisted by a graduate assistant, under the supervision of the director, in carrying out the dormitory program.

Two students customarily share a room in Magnolia Dormitories. Each student has his own single bed, closet, and study table. The dormitories contain a dining hall, well appointed lounge and recreational areas, a post office, a snack shop, and other facilities to make a complete living unit. The graduate assistant and assistant director have their apartments in the buildings.

Roy Sewell Dormitory, which houses 144 scholarship athletes, is equipped with dining facilities and is supervised by a resident staff member. There are two students in each of the 72 rooms, with separate study hall and lounge.

Room Reservations — Men who have been notified of tentative admission by the University are eligible for housing in Magnolia Dormitories. Requests for reservations should be addressed to the Director, Magnolia Dormitories. Applicants will receive materials descriptive of dormitory accommodations and housing agreement forms; or, they will be informed promptly if housing applications for that school quarter are in excess of capacity.

The completed Housing Agreement, with a \$50.00 check payable to Auburn University for room reservation deposit, should be returned promptly.

The deposit is held to cover possible loss and/or damage to dormitory property and as an Agreement guaranty and is not applicable to payment of room rent. Conditions governing refund of room deposit and prepaid rent are outlined in the Magnolia Dormitories Housing Agreement.

Precautionary measures are taken in all University dormitories and apartments to assure the security of the residents and their personal property. However, the University does not insure personal property of the residents and is not responsible for damage to, or loss of, personal property of occupants of University owned facilities. The University reserves the right to inspect periodically the rooms of students living in University housing.

Room and Board Charges — Room rent for air-conditioned rooms in Magnolia Dormitories is \$90.00 per school quarter. Rent for rooms not air-conditioned is \$70.00 per quarter. When available, private rooms are 50 percent additional. Residents of Magnolia Dormitories may elect to take meals in Magnolia Dining Hall, or elsewhere. The charge for meals, seven days a week (20 meals) in the Dining Hall is \$185.00 per school quarter. The charge for meals, five days a week (14 meals) is \$155.00 per quarter. The charge for two meals a day (9 meals a week), per quarter, is \$142.00. All board charges are subject to payment of applicable sales tax. Although every effort will be made to maintain the present room and board rates, it may be necessary to increase these charges if related costs advance abnormally.

Room rent is payable prior to the first day of classes each quarter. Board accounts for students electing to eat meals in Magnolia Dormitories are also due and payable in full each quarter. A late fee of \$5.00 will be charged on payments made during the first five days of classes. A late fee of \$10.00 will be charged on payments made after the fifth day of classes. However, when deemed necessary, arrangements may be made with the Cashier in the Magnolia Dormitories Office for payment in two installments.

Students who, at the beginning of a quarter, elect to have meals in Magnolia Dining Hall may withdraw from such arrangements within the first two weeks of the quarter. In these instances, there is a minimum charge for the two weeks plus a \$7.50 cancellation charge. No change in board arrangements may be made after this period has elapsed. Students withdrawing from school after two weeks will be charged on a daily basis plus the \$7.50 cancellation charge.

Off-Campus Housing. The majority of the male students reside in fraternity houses and in privately-owned housing within the community. These accommodations include dormitories, boarding houses, homes, trailers, and apartments. Charges for rooms without meals range from \$50.00 to \$180.00 for each school quarter. Prices for meals in the various restaurants and boarding houses range from \$170.00 to \$200.00 per quarter.

University representatives neither inspect nor approve off-campus housing. The only requirement is that the accommodations conform to the local code of health and safety regulations. However, the same general rules of student conduct apply in off-campus residences as are applicable in University operated dormitories. It is justifiably assumed that the conduct of each student living off-campus will reflect maturity of judgment and a feeling of pride in being a member of the Auburn community.

Thorough familiarity with the terms of the rental agreement and personal contact with the owner, or agent, will help avoid future misunderstandings. The quality of accommodations and the distance from the campus can best be determined through actual inspection before renting. A current file of available off-campus accommodations is maintained in the Office of Student Affairs, 304 Martin Hall.

Women Students

Housing for approximately 2,800 women is furnished in the women's dormitories. Residence in the dormitories is compulsory for all women students unless the Dean of Women gives them special permission to live elsewhere. A head resident is in charge of each dormitory and serves as counselor to the students as well as dormitory hostess. Women students are subject at all times to regulations of the University and the Associated Women Students.

All students residing in the dormitories must eat in the University dining halls where meals are served under the supervision of trained dietitians. Costs for special diets will be borne by the student.

The women's dormitories consist of the main dormitory group and the South Women's Dormitories.

In the main dormitory groups are the following:

No.	Name	No.	Name
I	Elizabeth Harper Hall	VIII	Ella Lupton Hall
II	Kate Conway Broun Hall	IX	Helen Keller Hall
III	Willie Little Hall	X	Marie Bankhead Owen Hall
IV	Kate Teague Hall	XII	Dana King Gatchell Hall
V	Letitia Dowdell Hall		Alumni Hall
VI	Allie Glenn Hall		Auburn Hall
VII	Mary Lane Hall		Noble Hall

Harper, Broun, Little, and Teague Halls, Social Center and the Women's Dining Hall form a quadrangle in the foreground of the dormitory area located across from the Auburn Union. The Dining Hall is readily accessible to all the dormitories in the area. Each of the dormitories, I through X, houses approximately 100 girls and is arranged in suites consisting of two double rooms connected by a tiled bathroom. The rooms are equipped with twin beds, a double desk, two desk chairs, a reading lamp, a bedside table, an easy chair and two chests. Lounge space is furnished in each building. Dormitories I through IV and VIII are air-conditioned.

Dana Gatchell Hall, located on Mell Street, adjacent to the other dormitories, houses approximately 50 girls. It has community baths located at the end of the hallways and is furnished in a manner similar to the other dormitories. Gatchell Hall is a cooperative dormitory. Here the girls prepare their own meals and do their own cleaning; as a result, cost of room and board is much less than in the other dormitories.

Alumni Hall, located on South College Street, houses approximately 100 girls. This dormitory has its own dining hall located in the basement of the building. The rooms are not in suites, there are community baths, and the furnishings are the same as in the other dormitories.

Auburn Hall, on East Thach Avenue, houses 182 girls. Community baths are located conveniently on each floor. The girls living here take their meals in Alumni Dining Hall, approximately two blocks away.

Noble Hall is located on West Magnolia, next to Magnolia Dormitory for men. It houses 170 girls and was newly decorated and furnished throughout in the fall of 1968. The rooms are not in suites and there are community baths on each floor. Girls living here take their meals in Magnolia Dining Hall.

The offices of the Dean of Women, the Assistant Dean of Women, the Assistant to the Dean of Women, the Dormitory Supervisor, and cashier's office, are located in Social Center. In addition, there are two large living rooms, a dining room, and a kitchen which may be used by student groups. The post office for the girls in this area is located on the ground floor of the Women's Dining Hall.

The South Women's Dormitories are located in the area in front of the President's home. Ten new air-conditioned dormitories, a dining hall, and an administration building are in the group.

The dormitories are:

A Mollie Hollifield Hall	F Dixie Bibb Graves Hall
B Annie Smith Duncan Hall	G Camille Early Dowell Hall
C Marguerite Toomer Hall	H Stella White Knapp Hall
D Zoe Dobbs Hall	J Mary Boyd Hall
E Berta Dunn Hall	K Sarah Sasnett Hall

Each of the three-story dormitories houses 110 girls and the six-story dormitories, Sasnett and Boyd, house 216 girls. The rooms are arranged in suites with a connecting bath between each two double rooms. Each room is furnished with twin beds, a bedside table, two desks and desk chairs, a double dresser and an easy chair. A formal lounge and an informal lounge are in each dormitory, with study rooms on each floor.

The administration building, Lucille Burton Hall, is similar to the Social Center and houses the office of the Head of Women's Housing, an Assistant to the Dean of Women, and the Assistant to the Dormitory Supervisor, the cashier's office and the post office for this area. There are several attractive lounges in the building and a number of guest rooms are on the second floor.

All students provide their own bed linens and any other items they may wish to use to make their rooms more attractive.

Room rent per school quarter is \$95 in Auburn and Alumni Halls, \$105 in the non-air-conditioned dormitories, \$115 in Noble Hall, and \$125 in the air-conditioned dormitories. This includes the cost of private phones which are located in each room. If a student moves into a room at the first of the quarter and then withdraws from the dormitory, she is charged a minimum of 1/3 of the room rent for the quarter.

All women students are required to take meals in the dormitory dining halls. There are three meal plans available. The cost of the seven days per week plan is \$175 plus sales tax. The cost of the five days per week plan is \$145 plus sales tax. The cost of the nine meals per week plan is \$132 plus sales tax.

Room Reservations — Dormitory reservation forms will be mailed to the applicant at the time she is accepted for admission to the University. This form must be returned to the Head of Women's Housing with a deposit of \$25.00

within three weeks of the date of acceptance. No room reservation is binding until this fee has been received.

Room assignments are sent out three weeks prior to the beginning of each quarter. Students are given the opportunity to prepay room and board fees, and information regarding rates and the dates of prepayment will be sent with the housing assignment. If a student is not on campus during the prepayment period, she may forward her prepayment by mail.

Room and board charges are due and payable in full at the beginning of each quarter. A late fee of \$5.00 will be charged on payments made during the first five days of classes. A late fee of \$10.00 will be charged on payments made after the 5th day of classes. However, when deemed necessary arrangements may be made with the Cashier in the Housing Office for payment of one-half the total room and board charges at the beginning of the quarter and the other half by mid-quarter.

Refund of room reservation fees will be made under the following conditions:

1. When reservations for the Fall Quarter are cancelled on or before August 1.
2. When the reservations for the Winter Quarter are cancelled on or before December 15.
3. When reservations for the Spring Quarter are cancelled on or before March 1.
4. When reservations for the Summer Quarter are cancelled on or before May 15.
5. When room is vacated at the end of a quarter and no further reservation is desired, if notice has been given by the deadline stated above.
6. When a student is prevented from entering because of scholastic deficiencies.
7. When personal illness or physical injury necessitates cancellation of reservations.

A room reservation is not valid unless the applicant has been admitted to Auburn University.

Married Students

Auburn University operates the Caroline Draughon Village housing project for married students. The project has 384 apartments. Of these, there are 160 two-bedroom air-conditioned, 64 two-bedroom non-air-conditioned, and 160 one-bedroom non-air-conditioned apartments.

The apartments are furnished including an all electric kitchen, completely furnished living room and one bedroom, spacious closets, ample cabinets, all tile baths with shower-tub combination, innerspring mattresses, steam heat, and television outlet.

Deposits are accepted for housing in Caroline Draughon Village from fulltime prospective married students who have been accepted for admission. Previously married individuals accompanied by at least one child are also eligible for these apartments. For additional information, write: Frank Reeves, Housing Manager, 901 W. Thach Avenue, Auburn, Alabama 36830.

Off-Campus Housing — In addition to the University-operated apartment projects, housing may also be obtained in apartments, houses, and trailers in the

Auburn community. Rent for these facilities is competitive with University-operated housing. The same general rules of conduct applicable in University-operated apartments and the same referral services of the Student Affairs Office, 304 Martin Hall, as indicated on page 26, apply for married students living off-campus.

Fees and Charges

THE FOLLOWING FEES AND CHARGES ARE IN EFFECT AT THIS TIME. HOWEVER, SINCE THE CATALOG MUST BE PUBLISHED CONSIDERABLY IN ADVANCE OF THE NEXT SCHOOL YEAR, IT IS NOT ALWAYS POSSIBLE TO ANTICIPATE CHANGES AND THE FEE SCHEDULE MAY BE REVISED. EVERY EFFORT WILL BE MADE TO PUBLICIZE CHANGES AS FAR IN ADVANCE AS POSSIBLE.

Auburn University's fees have remained somewhat lower than fees charged at similar institutions in the Southeast and throughout the Nation as a whole. As costs have risen small increases in fees charged have been authorized by the Board of Trustees from time to time to meet these increased costs. Every effort is made to hold these charges to the minimum.

Payment of fees and charges — Students are expected to meet all financial obligations when they fall due. Auburn University reserves the right to deny admission to or to drop any student who fails to meet promptly his financial obligations to the University. It is each student's responsibility to keep informed of all registration and fee payment dates, deadlines and other requirements by referring to the official university calendar of events in the catalog, announcements printed in the *Plainsman* or disseminated through other media from time to time. Where necessary, students should inform their parents of the deadline dates and the necessity for meeting them.

Checks — Checks given in payment of fees and charges are accepted subject to final payment. If the student's bank does not honor the demand for payment and returns the check unpaid, the student will be assessed the late penalty of \$5.00 or \$10.00, whichever is applicable, and if payment is not cleared promptly the student's registration will be cancelled.

Veterans — Veterans enrolled under the Federal G.I. Bill P.L. 358 and P.L. 634 receive their allowances directly from the Government and are responsible for paying their fees and charges on the same basis as other students (This does not apply to P.L. 894 or P.L. 815).

Alabama and Non-Alabama Student Policy

FOR THE PURPOSE OF ASSESSING FEES, APPLICANTS SHALL BE CLASSIFIED AS ALABAMA OR NON-ALABAMA STUDENTS. NON-ALABAMA STUDENTS (EXCEPT GRADUATE STUDENTS AND SONS AND DAUGHTERS OF MINISTERS) ARE REQUIRED TO PAY A TUITION FEE. An Alabama student is a person who shall be a citizen of the United States or a resident alien and who shall have resided and had his habitation, home, and permanent abode in the State of Alabama for at least twelve (12) months immediately preceding his current registration. In applying this regulation, "applicant" shall mean a person applying for admission to the institution if he is married or 21 years of age, or, otherwise, it shall

mean parents, parent or legal guardian of his or her person. If the parents are divorced, residence will be determined by the residency of the parent to whom the court has granted custody. The status of a wife will be considered to be that of her husband.

In the determining of an Alabama student for purposes of assessing fees, the burden of proof is on the applicant. An applicant can change his status from non-Alabama to Alabama student only by actually and physically coming into the state for the required period with the intention of residing within the state.

A non-Alabama student may apply in writing for reclassification prior to any subsequent registration. To qualify for reclassification as an Alabama student, the applicant (1) shall present evidence of having resided in Alabama for twelve (12) consecutive months preceding his request for reclassification, (2) shall submit evidence that he has met the usual and expected obligations of an Alabama citizen, and (3) shall file a declaration of intent to reside in Alabama. An alien shall have resided in Alabama for twelve (12) months and must present U.S. Immigration and Naturalization certification that he is a resident alien. If the application is supported by evidence satisfactory to the University that the student then qualifies as an Alabama student, his classification may be changed for future registrations.

A dependent of a member of the Armed Forces stationed in Alabama on active duty by official orders shall not be liable for payment of non-Alabama tuition during the period of military assignment in Alabama. Dependents of a member of the Armed Forces not stationed in Alabama must furnish proof of Alabama domicile. Verification of "Home of Record" must be attested to by military authority for a minimum period of one year before entry of the student.

The Registrar shall have the responsibility for determining whether a student shall be classified as an Alabama or non-Alabama student. The decision of the Registrar shall be subject to review by the President or his designated representative upon written request of the applicant.

Basic Quarterly Charges

Students should be prepared to complete Registration by payment of these fees upon notice two weeks to three weeks before the beginning of the quarter.

SEE FEE PAYMENT DATES ON CALENDAR. (Pages 2 and 3)

Any student taking 10 or more credit hours or who is certified by the Graduate School as a full-time student will pay full fees.

University and Student Activities Fee (All Curricula EXCEPT Veterinary Medicine)	\$150.00
University and Student Activities Fee for Veterinary Medicine	200.00

The University Fee is used to meet part of the cost of instruction, physical training and development, laboratory materials and supplies for student's use, maintenance, operation, and expansion of the physical plant, Library, Student Health Services and Student Activities.

The Student Activities Fee supports such activities on campus as inter-collegiate athletics, exhibits, *Glomerata*, intramural sports, *Plainsman*, lectures and concerts, religious life, social affairs,

student government, student union activities and operations, and *Tiger Cub*. This fee includes 25¢ held in reserve to cover unnecessary damage to University property by students.

Non-Alabama Fee \$150.00

Additional fee charged all non-Alabama full-time undergraduate, special, and unclassified students. This fee is not charged to graduate students and dependent sons and daughters of ministers. (See preceding page relation to residency requirements.)

Part-time Students (not exceeding 9 hours per quarter.)

Registration fee 20.00

Additional fee per credit hour 13.00

No additional charge is made beyond 10 hours and students who register for 10 or more hours will pay a maximum of \$150.00 as residents or \$300.00 as non-residents. The \$20.00 registration fee is remitted to full-time faculty and staff taking no more than five credit hours. All students except faculty and staff are eligible to participate in Student Health Services and Student Activities.

Clearing for Graduation Fee 20.00

A student who is a candidate for a degree in a quarter in which no credit work is taken is required to register in such quarter as a pre-requisite to graduation. (For members of the faculty and staff the charge shall be reduced to \$5.00.) Graduation fee is to be paid in addition to this charge.

Other Fees & Charges

Service and Penalty Charges for Late Registration

or Payment 5.00-10.00

All students, regardless of classification, must clear fees and tuition by the deadline set by the University, or pay the following additional charges:

Through official schedule adjustment period. 5.00

Effective with beginning of classes. 10.00

Achievement Certificate Fee 5.00

Application Fee 10.00

The Application Fee must accompany all applications for admission for Undergraduate students. (Not required for application to Graduate School.) It is not refundable or applicable to registration fees.

Auditing Fee (per course) 13.00

Any student who pays less than full fees must pay this fee for auditing a course. (Not charged to faculty and staff.)

Cap and Gown Rental Fees (for Graduation Exercises)

(includes retaining of tassel)

Bachelors—Cap and Gown 3.50

Masters—Cap, Gown, and Hood 6.75

Doctorate—Cap, Gown, and Hood 7.40

Change in Course Fee 5.00

Charge is made in cases where student is not required or advised

Room and Board (Men)	\$212.00 to \$275.00
Residents in the dormitories for men may elect to take their meals in the dormitory dining halls, or elsewhere. Men students may also live off-campus. (Rate subject to change without prior notice if necessary due to increased food, labor, and operational costs.) For further information see page 25. (Add sales tax for meals.)	
Rent—Married Student Apartments	72.00 to 90.00
ROTC Uniform and Equipment Deposit (refundable)	30.00
All students, both Basic and Advanced, are required to deposit the sum of \$30.00 with the Bursar of the University, prior to enrollment in ROTC, except Naval ROTC. They are then furnished a uniform in good condition and other necessary supplies through the ROTC Supply Office. Upon completion of the ROTC course of instruction, or upon withdrawal of the student therefrom, the uniform and other supplies are turned in and the deposit returned to the student, less \$1.50 per quarter withheld by the Bursar of the University to cover the cost of repair of uniforms, when applicable, and to support ROTC activities as follows: scholarship and marksmanship awards; special apparel and equipment for competitive drill teams, ROTC honoraries, and rifle teams representing Auburn University ROTC; uniforms for sponsors; the official annual Military Ball in an amount not to exceed \$.40 per cadet enrolled that quarter. This charge is subject to change in accordance with requirements of the Army, Navy, and Air Force training programs.	
Service and Penalty Charges	
(a.) Registration fees billed home	2.00
(b.) Charge for returned checks (each)	2.00
(c.) Failure to pay fees due or make returned check good on notice, where two or more notices required	5.00 or 10.00
Notice — CHECKS ARE ACCEPTED SUBJECT TO COLLECTION	
Special Examination Fee	
If taken at a regularly scheduled period	2.00
If taken out of regularly scheduled period	5.00
Special Services Fees	
Cooperative Education Program	\$15.00
Internship Fee — Veterinary Medicine	15.00
Postdoctoral Fellow; One-time enrollment	15.00
Transcript Fee	1.00
Registration Fee Cancellations or Refunds	
If student pays fees prior to opening of the quarter then officially resigns PRIOR to the beginning of the quarter all fees (except late fees) will be refunded. If student resigns within the first two weeks after classes begin, all fees, less charges, will be refunded except the sum of \$20.00 will be retained as a handling fee, and if the student has used the University Health Services during that	

quarter, the \$7.00 Health Services Fee will be retained also. No refunds will be made in case of withdrawal (resignation) after two weeks of classes, except in cases of withdrawal caused by personal illness (statement of confirmation from physician required) or call into Military Service (copy of activation orders required). Students suspended for disciplinary reasons are not eligible for refunds or cancellation of accounts due.

See Auburn University at Montgomery Bulletin for fees and charges at the Montgomery Division.

Financial Aid

Auburn University has an Office of Student Financial Aid to provide financial assistance to aid worthy students in meeting educational costs incurred while attending the University.

The University subscribes to the principle that the amount of financial aid granted a student should be based upon financial need. As an instrument for determining need, Auburn uses the ACT Need Analysis System of the American College Testing Program, Inc. Entering students seeking financial assistance are required to submit each year the Family Financial Statement (FFS) to the American College Testing Program, designating Auburn University as one of the recipients. Applications for aid should be completed in January or February of the year prior to the academic year for which assistance is required, when possible.

A brochure describing financial aid programs and procedure for making application may be obtained by writing to the Office of Student Financial Aid, Auburn University.

Available Assistance Programs

Scholarships — Awards made to students with financial need who have demonstrated high academic promise and attainment.

Federal Educational Opportunity Grants — Limited number of grants for students with exceptional financial need.

National Defense Student Loan and Institutional Loans — Long term loan programs for students who can demonstrate need.

Federal-State Student Guaranteed Loans — Long term loan program whereby students may borrow from lending institutions (banks, credit unions, etc.)

College Work-Study Program — Program of employment for college students coming from low income families, who need to work to remain in school.

Health Professions Assistance Programs — Provide long term loans and scholarships for students studying in the professional Schools of Pharmacy and Veterinary Medicine.

Law Enforcement Education Program — Provides for grants and loans to students with the purpose of upgrading the general caliber of police, correc-

tions, and court officers at all levels of government and to encourage students to seek law enforcement careers.

Graduate Aid — To promote Scholarship and research among graduate students, a number of Graduate Teaching Assistantships, Graduate Research Assistantships, Graduate Fellowships and Traineeships are available. Contact the Head of Department of major interest for information and application.

Social Security — Consult the local or county Social Security Office.

Vocational Rehabilitation — Consult the State Rehabilitation Office, Room 461, State Office Building, Montgomery, Alabama 36104.

Benefits For Veterans And Dependents Of Veterans

Federal — Consult local County Veterans Service Officer or Veterans Administration Office, Montgomery, Alabama 36104.

Many current publications describe in complete detail the educational programs authorized by Congress under the following federal acts: Public Law 16 (Vocational Rehabilitation), Public Laws 894 and 815 (Vocational Rehabilitation Revised), Public Law 634 (War Orphans Educational Assistance Act) and Public Law 358 (Veterans Readjustment Benefits Act of 1966).

Auburn University is fully approved by the Veterans Administration to give training under these laws. Veterans planning to attend school under one of these laws should make application directly to the Veterans Administration and get prior approval before entering school.

Those entering school under the benefits of any one of the laws should have sufficient funds to finance themselves for one quarter or at least until payments begin coming in from the Veterans Administration (approximately two months).

For further information write to the Office of Student Financial Aid, Auburn University, Auburn, Alabama.

State — Consult the Department of Veterans Affairs, P.O. Box 1509, Montgomery, Alabama 36104.

Employment

The Student Financial Aid Office, 202 Martin Hall, provides available information concerning off-campus student employment. This information is posted on the Financial Aid Bulletin Board located in the basement lounge of Haley Center.

Students desiring to work for the University must apply directly to the department with which they are seeking employment.

Student wives and other non-students may secure assistance in locating suitable employment on the campus by contacting the University Personnel Office located on the ground floor of Langdon Hall.

Student Services

The Dean of Student Affairs, the Dean of Women, and their respective staffs assist students with their problems and aid them in adjusting to University life. Their offices serve as general clearing houses for matters pertaining to the welfare of all students.

The Dean of Student Affairs works with individuals and groups in areas of mutual concern. His office is located in Mary E. Martin Hall. He supervises men's dormitories, campus publications, the Student Development Services, and Union activities, and he serves as adviser to organizations, fraternities, and the Student Government Association.

The Dean of Women's duties include matters pertaining to the welfare of all women students. As Social Director, she approves all social functions that University women attend. Also she supervises women's housing and is adviser to sororities and Associated Women Students. She and her staff have offices in the Social Center.

Student Development Services

A variety of services is provided for all students free of charge by the Student Development Services in 305-318 Martin Hall. Students may come by the offices in person to make an appointment or call 826-4744. The offices are open from 8 a.m. to 12 noon and 1 to 5 p.m., Monday through Friday. The services offered by the Student Development Services are available to all Auburn University students. These services include: Counseling and Mental Health Services, Environmental Service, and Evaluation Service.

Counseling And Mental Health Services

The staff of the Counseling and Mental Health Service thinks of counseling as a process in which the student comes to the counselor voluntarily to gain additional self-understanding that he may solve his own problems as they arise now and in the future. The counselors are concerned with helping students find solutions to their problems. They respect the ability of the students to make their own choices after they have a better understanding of themselves. Counseling is available to all students at Auburn. These services include:

Career Counseling. Counselors assist students in making a thorough self appraisal of interests, abilities, and personality traits so that they may utilize this information in making a wise career choice. Counselors interpret the data from tests, discuss all possibilities of success, and help the student work through the decision-making process.

Educational Counseling. Students who are indecisive about a major, or who wish information on their adaptability to select programs of study may gain a realistic appraisal of themselves through counseling and become better equipped to make more intelligent academic choices.

Personal Counseling. Many University students have personal concerns which may interfere with their academic success. Counselors attempt to offer an atmosphere in which students may discuss such problems freely and confi-

dentially. Personal emotional adjustment, dating, marriage, home relationships, social relationships, adjustment to college work, and plans for the future are only a few of the many concerns. Often, effective solutions can be reached by a student through a counselor-counselee relationship.

Group Counseling. Individual growth and development often are enhanced by experiences in small groups that meet regularly with Counseling and Mental Health Services staff members.

Career Information Library. The student interested in studying a curriculum or an occupation in terms of a career choice will find that this library has information about hundreds of fields. It is open 40 hours a week and no appointment is needed. Deans office counselors and professors are invited to refer students to the reading room.

Conferences with Prospective Students. High school seniors and college students who wish to explore curriculum offerings at Auburn University can arrange for a 30 to 40 minute appointment. Alternate dates and hours should be proposed so that the appointment will fit in with a counselor's schedule. By mail, a week or 10 days is needed as time for confirmation. If the appointment is made by telephone, the time interval may be as short as a day or two. Parents of high school seniors are invited to participate in these conferences.

Environmental Service

Many problems encountered by the student require adjustment on his part. However, some problems have their source in the students environment and are best dealt with by altering the environment in some way. Environmental specialists assist the student in this endeavor.

Married Student Services. This group of students often find themselves out of the "mainstream" of University activities. They also have special concerns different from single students. Assistance is available to married students and their families to deal with any area of concern.

Minority Student Services. Many cultures are represented in a university student body. Each student is aided in developing within the context of his own cultural heritage while at the same time gaining a better understanding of other cultures.

Legal Services. The legal advisor assists students in becoming aware of the role of the law in their relationships with others. While not representing the student, he does help the student understand the alternates he may pursue and the consequences that may result from each.

Evaluation Service

Evaluation Service assists students in developing skills involved in learning.

Study-Partner Program. Students are able to receive aid in several academic areas from study partners approved by their academic departments. Study partners are available for immediate help during specified hours.

Study-Skills Program. Students wishing to develop skills in such areas as notetaking, listening, briefhand and reading can do so through the study-skills program.

Testing. A wide variety of tests are available to aid in the counseling process. Results of these tests are confidential and are used only for the benefit of the student.

University Placement Service

The University Placement Service assists students and alumni in securing business and professional positions through its contacts with potential employers. The service is available to any student or alumnus without charge.

Representatives of commercial and industrial firms as well as government agencies visit the office each quarter for personal interviews with students.

Seniors and graduate students who desire information and placement assistance should confer with the Director, 400 Martin Hall.

Student Health Service

The Student Health Service of Auburn University renders the following services: (1) out-patient medical and surgical service by staff doctors only; (2) hospitalization at the University Infirmary; (3) local ambulance service; (4) medical supervision of the physical education and athletic programs; (5) health education; and (6) campus sanitation.

The University owns and operates a 55-bed infirmary equipped with a modern clinical laboratory and X-ray facilities. Working in conjunction with the State Health Department, annual tuberculosis skin testing is available for students, faculty and employees of the institution.

Each entering student is required to file a medical examination report completed by a physician before he can be admitted to Auburn University. Forms for this report will be furnished by the University.

The Student Counseling Service and the Student Health Service are available to students in helping them solve emotional problems. A psychiatrist is also in attendance at the Infirmary. The Infirmary also has a well-equipped physiotherapy department. A qualified physiotherapist is in attendance two afternoons each week.

No major surgery is performed in the Infirmary. Elective surgery should be performed in the student's home town, or by referral to a specialist during vacation periods or to a local surgeon. Emergency surgical operations are the responsibility of the student. Students who are in need of emergency operations and those having severe multiple or compound fractures will be referred for treatment and the expense will be a responsibility of the student. The University has available a surgical consultant who may be called when needed. The expense will be charged to the student requiring such consultation.

The Student Health Service is available to all regularly enrolled students of the institution. Medical service is not provided by the University for the families of married students, but a list of local physicians will be made available by the Student Health Service upon request.

The Out-Patient Clinic is open from 8:00 a.m. to 11:30 a.m. and 1:00 p.m. to 6:00 p.m. each week day, Monday through Friday. Clinic hours are from 9:00 a.m. to 12:00 noon and 3:00 to 4:00 p.m. on Saturday, and 3:00 to 4:00 p.m. on Sunday. Emergency treatment is available 24 hours daily. Visiting

hours at the Infirmary are from 10:00 a.m. to 1:00 p.m., 3:00 p.m. to 8:00 p.m. each day. Only two visitors per patient are allowed simultaneously.

University physicians do not make calls outside the Infirmary or attempt to treat students in their rooms. Students who are too ill to come to the Infirmary will be furnished with local ambulance service. Parents will be notified by the University physician if a student is believed to be seriously ill.

Each student is entitled to 15 days free hospitalization at the University Infirmary during each school year. This includes professional services of the medical staff of the Student Health Service, general floor nursing care, ordinary medications, room and board, linen, routine laboratory and X-ray procedures.

The Student Health Fee does not include surgery, consultation, special X-rays, special medication, laboratory procedures or special nurses. The student will be billed by the person providing the services.

The services of local physicians are available at the students' expense either at their places of residence or when properly admitted to the University Infirmary.

The Infirmary is closed between quarters but will be available for emergency service to students on campus for University approved or sponsored functions.

During epidemics, the staff of the Student Health Service will make every possible effort to care for ill students at the Infirmary, but if Infirmary staff and facilities should be inadequate, the University will not assume responsibility for payment of services rendered by outside doctors or other hospitals.

Speech And Hearing Clinic

The Speech and Hearing Clinic of the Department of Speech Communication provides a full range of services for children and adults, including comprehensive speech and hearing examinations. Students with speech or hearing problems are urged to contact the Speech and Hearing Clinic during their first quarter of residence. The Speech and Hearing Clinic also carries on a continuing program to provide assistance for all students for whom English is a second language. Appointments may be made in Room 1199 Haley Center for speech and/or hearing examinations or by calling 826-5545. Auburn University students are charged one-half of the usual clinic fees.

Student Bookstores

Alpha Phi Omega service fraternity sponsors a non-profit bookstore on the campus. The purpose of this store is to provide a more economical means for students to purchase and sell their books. The bookstore is located in the subway of the "L" building. A University Book Store is located in Haley Center.

Student Insurance

The Student Government Association sponsors two Accident and Sickness Insurance Plans, which are available to all full-time or part-time undergraduate and graduate students. The Plans provide maximum coverage at minimum cost and are underwritten by the Continental Insurance Companies.

Plan I offers limited benefits for a low premium; Plan II covers major medical expenses for a higher premium. Benefits for both Plans include hospital fees and expenses, surgery, visits by a physician, ambulance service, X-rays, as well as other items.

Enrollment in either Plan is solicited during each registration period but it is available throughout the year, covering single students as well as married students and their families.

Further information may be obtained from the Office of Student Affairs, 304 Mary Martin Hall.

Student Activities

The Student Body

The Student Government Association is the organization which officially represents the student body. Upon enrollment at Auburn University, each student becomes a member of the S. G. A. Its primary objective is that of working cooperatively for the betterment of Auburn students. All students are encouraged to participate in the Student Government Association and to become involved in the political life of the campus.

Student Government is composed of the executive, legislative, and judicial branches. The executive group consists of the president, vice-president, secretary, treasurer, and members of the executive cabinet. Members of the legislative branch, the student senate, represent the ten University schools. In addition, there are 15 district senators. The student jurisprudence committee has a presiding justice and six associate justices.

Officers and senators of the Student Government Association are elected by members of the student body in the Spring Quarter general elections. Other positions are appointive by the president with concurrence by the senate. The Student Government Constitution and Laws, published in the *Tiger Cub*, details the functioning of student government.

Associated Women Students

The purpose of the Associated Women Students is to uphold high standards of scholarship, and to create, promote and maintain a high sense of honor and integrity in all phases of University life.

1. In cooperation with the Student Body of Auburn University, the administration and faculty, to uphold high standards of scholarship; to create, promote, and maintain a high sense of honor and integrity in all phases of university life, and to provide a forum for the expression of the views of the individual woman student at Auburn.

2. To encourage a sense of individual responsibility, to further a spirit of unity among women students, and to train students in democratic participation in government.

3. Through Councils, to enact and enforce regulations and to sponsor activities which will contribute to the well-being of the students.

Each Auburn undergraduate woman student is automatically a member of AWS when she enters the University. AWS is made up of three councils: the Executive, Legislative, and Judiciary. The Legislative Council is composed of representatives of the dormitory house councils and the elected officers.

AWS plans and conducts a well-organized program for women students.

Student Publications

The Auburn Veterinarian — booklet published quarterly for and by students in Veterinary Medicine.

The Glomerata — student publication; production costs covered by Student Activities Fee, student organizations and advertising.

The Helm — a quarterly paper published by NROTC students.

The Auburn Plainsman — a weekly paper published by students of the institution; production costs covered by Student Activities Fee and advertising.

The Tiger Cub — annual student handbook; production costs covered by Student Activities Fee and advertising.

All publications and radio stations supported by the Student Activities Fee are subject to supervision by the Board of Student Communications.

The Auburn Union

The Auburn Union is the center of non-academic student and faculty life. The building, located in the heart of the campus, provides a living room for students away from home — a place to relax, to entertain friends, and to find convenient dining services. Planned programs of social, recreational and cultural events help develop students in the art of human relations.

Located in the Auburn Union are the War Eagle Cafeteria and Snack Bar, Alumni Offices, Faculty Club, Student Government Offices, Publications Offices, Union Ballroom, meeting rooms for student organizations, commuters lounges, banquet rooms, reading and TV lounges, and Union staff offices.

The main desk has become the central information center on campus. On hand are the registration cards of each student enrolled, listing class schedule, home address, and campus address.

Cultural, Musical, Theatrical Activities

Concerts. At least five outstanding concerts or concert artists are presented each year through the Auburn University Concert Committee. Students are admitted free upon presentation of their I.D. cards. Season tickets are available for faculty and townspeople at reduced rates, and single admissions can be obtained at the door.

Lectures. The Auburn University Lecture Series, supported by Student Activity fees, sponsors a variety of lecturers in all the disciplines and areas of student interest. In addition, several endowed lectureships bring prominent scholars to the campus for public addresses, open to the University and the general public. Many of these lecturers conduct specialized seminars and group discussions with students while on the campus.

Auburn University Theatre. The Department of Theatre functions as producer for this organization. The season of plays reflects the commitment of the Department to expose actors, designers, technicians and teachers to a wide variety of literary theatrical forms and to present this material to the entire University and city community for its enjoyment and cultural enrichment. At present, seven productions are being offered during the regular school year. Two of these are children's plays which tour public schools in Alabama and Georgia. Students and faculty members from all areas of the University are welcome to audition for all productions. The Auburn Players is a dramatic organization whose purpose is to promote interest and participation in the theatrical field.

Auburn University Concert Choir is open to all students by audition. The choir sings concert and special programs on campus each quarter, takes an annual spring tour, makes regular television appearances, and sings for various functions around the state. Rehearsals are held daily, and degree credit is available.

Choral Union, a large chorus, is open to all students by permission of the director. This group usually sings two concerts a year, consisting of large choral works, often with the Auburn Symphony Orchestra. Rehearsals are held once a week and degree credit is available.

Men's Glee Club is open to all male students. It makes regular appearances on campus and in the surrounding area. The music is of a lighter nature, including popular music and Auburn songs. Rehearsals are held once a week, and degree credit is available.

Marching Band. Auburn University supports a Marching Band which frequently accompanies the football team on game trips, and represents the University at various campus, state, and out-of-town functions. It consists of approximately 200 players who receive special training in drill formations. Physical Education may be waived during the fall quarter for students who are members of the Marching Band.

Concert Band consists of advanced students who have passed the work of the preliminary bands, and students who are preparing to teach band in the schools. It provides music for various University activities and some off-campus concert tours. Regular training which embodies instruction in the rudiments of music and the use of band instruments is given free of charge at the band practice periods. These activities may be taken with or without degree credit.

Orchestra. The Music Department sponsors this symbolic group for the development of musical talent and perfection of individual achievement in ensemble playing. Students in the early stages of musical training, especially those in violin, viola and cello, are invited to participate. Membership is by permission of the director. This activity may be taken with or without degree credit.

Opera Workshop. The Workshop is open to all students interested in musical or dramatic work in producing operas. Membership is open with or without degree credit. Students are trained in the various phases of operatic production largely through performances of scenes from outstanding operas.

Educational Television. Programs produced in the Auburn Television Studio are seen throughout the state on the Alabama ETV Network, 2, 7, 10,

25, 26, 36, 42, and 43, with some series distributed nationally. Staff members in all areas of instruction, research and extension take part in this programming. The Studio offers opportunity for Auburn students in television either through regular courses, positions for observation or employment in either the technical or program production areas.

Intramural Sports

Intramural sports offer students many opportunities to participate in competitive team and individual sports, and recreational activities. Healthful sports, good sportsmanship, and friendly competition are stressed. All students are urged to participate in the program which is entirely voluntary and largely student-supported and supervised.

Regular tournaments are offered in seasonal team and individual sports.

Fall Quarter. — Touch football, swimming, volleyball, golf.

Winter Quarter. — Basketball, bowling, table tennis, weight lifting, wrestling.

Spring Quarter. — Badminton, softball, tennis, track, horseshoes.

Summer Quarter. — Softball, tennis, golf, swimming, bowling.

Intramural sports for men also operates check-out services in the Student Activities Building, Memorial Coliseum, and Magnolia Dormitory. Any student or student group may check out recreation equipment on a daily basis.

Informal recreational hours are scheduled for leisure time activities at the Student Activities Building, Sports Arena, and Memorial Coliseum.

Organizations

National Honor Societies

The following members of the Association of College Honor Societies have established chapters at Auburn:

Alpha Epsilon Delta (Pre-Medicine)	Phi Alpha Theta (History)
Alpha Lambda Delta (Freshman Scholastic—Women)	Phi Eta Sigma (Scholarship—Freshmen—Men)
Alpha Pi Mu	Phi Kappa Phi (Scholarship—Senior Men and Women)
Alpha Psi Omega (Theatre)	Pi Sigma Alpha (Political Science)
Chi Epsilon (Civil Engineering)	Pi Tau Sigma (Mechanical, Aerospace Engineering)
Delta Sigma Rho — Tau Kappa Alpha (Forensics)	Psi Chi (Psychology)
Eta Kappa Nu (Electrical Engineering)	Rho Chi (Pharmacy)
Mortar Board (Student Leadership—Senior Women)	Sigma Delta Pi
Omicron Delta Kappa (Student Leadership—Junior & Senior Men)	Sigma Gamma Tau
Gamma Sigma Delta (Agriculture)	Sigma Pi Sigma (Physics)
Kappa Delta Pi (Education)	Tau Beta Pi (Engineering)
Omicron Nu (Home Economics)	Xi Sigma Pi (Forestry)
	Pi Mu Epsilon (Mathematics)
	Pi Delta Phi (French)

National Recognition Societies

The following national societies have chapters established at Auburn:

Alpha Phi Omega (Campus Service—Men)	Scabbard and Blade (Military)
Alpha Zeta (Agriculture)	Semper Fidelis (Marine Corps ROTC)
Arnold Air Society (Air Force ROTC)	Sigma Alpha Eta (Speech Pathology)
Angel Flight (AFROTC Coed Auxiliary)	Sigma Delta Pi (Spanish)
Black and Bridle (Animal Science)	Sigma Gamma Tau (Aerospace Engineering)
Capers (Army ROTC Coed Auxiliary)	Sigma Tau Delta (English)
Cwens (Student Leadership—Sophomore Women)	Steerage (Navy ROTC)
Omicron Delta Epsilon (Economics)	Pershing Rifles (Air Force & Army Basic Cadets)
Omicron Kappa Pi (Architecture)	

Campus Leadership and Service Organizations

"A" Club—Varsity lettermen in baseball, basketball, football, track or cheerleading
 Afro-American Association
 American Civil Liberties Union
 Associated Women Students
 Auburn Chapter of the Alabama Conservancy
 Auburn Collegiate Civitan Club
 Auburn Sport Parachute Club
 Auburn University Rifle Club
 Auburn Veterans Association
 Auburn Human Rights Forum
 Circle K Club—International Service Club for college men sponsored by Kiwanis International
 Chinese Student Association
 Conservative Club—For those students interested in conservative government
 Gamma Sigma Sigma—Women's Service Organization
 International Relations Club
 Spades—Honor Society of ten most outstanding senior men
 Squires—Honor Society for most outstanding sophomore men
 University Jaycee's
 War Eagle Girls—Official University Hostesses
 Young Democrats Club
 Young Republicans Club
 Zero Population Growth, Inc.

Religious Organizations

Baptist Student Union—Baptist The Canterbury Forum—Episcopal Church of Christ Student Group—Church of Christ Christian Science Organization—Christian Science Jewish Hillel Group—Jewish Latter Day Saints Students Organization	Lutheran Student Fellowship—Lutheran Newman Club—Catholic Unitarian Universalist Fellowship—Unitarian Wesley Foundation—Methodist Westminster Fellowship—Presbyterian Campus Crusade For Christ (nondenominational) Navigators (nondenominational)
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Departmental and Professional Organizations

Agriculture Council Agriculture Economics Club Agronomy Club Alpha Zeta American Society for Agriculture Engineers Auburn Student Chapter of the Wildlife Society Block and Bridle Club Forestry Club Horticulture Forum American Institute of Architects, Student Chapter American Institute of Interior Design Architecture and the Arts Council Auburn Lonely Arts Club Auburn Players Builders' Guild Delta Omicron Industrial Designers' Society of America Industrial Design Forum Keystone Omicron Kappa Pi Phi Mu Alpha Sinfonia Sigma Lambda Tau American Chemical Society Arts & Sciences Student Advisory Council Auburn Law Society Lambda Tau Pi Mu Epsilon Pre-Veterinary Medicine Association Sigma Tau Delta Society of Physics Students Sociology Club American Society of Personnel Administration Auburn Marketing Society Auburn Student Accounting Association	Delta Nu Alpha Delta Sigma Pi National Collegiate Association of Secretaries Society for the Advancement of Management Association for Childhood Education Council for Exceptional Children Future Farmers of America Health, Physical Education, and Recreation Club Industrial Arts Club Kappa Delta Pi Phi Delta Kappa Sigma Alpha Eta Student National Education Association Alpha Eta Rho American Institute of Aeronautics and Astronautics American Institute of Chemical Engineers American Institute of Industrial Engineers American Society of Civil Engineers American Society of Mechanical Engineers Auburn Engineers' Council Institute of Electrical and Electronic Engineers Phi Lambda Upsilon Pi Gamma Tau Auburn Student Home Economics Association Fashion Incorporated Home Economics Faculty—Student Council American Pharmacy Association Kappa Epsilon Kappa Psi Pharmacy Council Phi Lambda Sigma Phi Delta Chi
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Auburn Student Chapter of the American Veterinary Medical Association
 Jr. American Veterinary Medicine Association Auxilliary

Student Wives Clubs

Dames Club
AVMA Auxiliary (Student Chapter)
Keystones (Building Construction)

Pharmacy Wives Club
Wives of Auburn Engineers

Social Fraternities

Alpha Epsilon Pi
Alpha Gamma Rho
Alpha Psi (professional)
Alpha Tau Omega
Beta Theta Pi
Chi Phi
Delta Chi
Delta Sigma Phi
Delta Tau Delta
Delta Upsilon
FarmHouse (colony)
Kappa Alpha Order
Kappa Sigma
Lambda Chi Alpha

Omega Tau Sigma (professional)
Phi Delta Theta
Phi Gamma Delta
Phi Kappa Tau
Pi Kappa Alpha
Pi Kappa Phi
Sigma Alpha Epsilon
Sigma Chi
Sigma Nu
Sigma Phi Epsilon
Sigma Pi
Tau Kappa Epsilon
Theta Chi
Theta Xi

The Interfraternity Council regulates the relationships between the member fraternities.

Sororities

Alpha Chi Omega
Alpha Delta Pi
Alpha Gamma Delta
Alpha Omicron Pi
Chi Omega
Delta Delta Delta
Delta Zeta

Gamma Phi Beta
Kappa Alpha Theta
Kappa Delta
Kappa Kappa Gamma
Phi Mu
Pi Beta Phi

The Pan-Hellenic Council regulates the activities of the sororities.

Special Programs

Correspondence Study Program

The Correspondence Study Program provides undergraduate instruction for persons unable to attend college on a regular basis. Correspondence courses parallel those given in the University and are taught by members of the University faculty. All courses carry college credit.

Organization of Courses — A complete course outline with full information and instructions is sent to the student upon registration. Courses consist of varying amounts of credit and numbers of units. Each work unit requires certain textbook readings and written preparation. Supplementary reading and reports may be required of the student by the instructor on any assignment. Written work is submitted to the Correspondence Study Office.

Qualifications — Any person who might profit from college level courses is eligible to enroll. No entrance examination is required for admission to correspondence study, but the right is reserved to reject any applicant who does not furnish complete or satisfactory data on the formal application. Enroll-

*Organizations marked by an asterisk are serving a trial period prior to official University recognition.

ment for correspondence study does not constitute admission to Auburn University.

Restrictions placed on Auburn University students regarding correspondence work are described in the regulations in Section III of the Correspondence Study Bulletin.

Credit — Undergraduate credit equivalent to that earned in regular college classes is given for correspondence work. Although graduate credit cannot be earned by correspondence, certain undergraduate deficiencies may be cleared.

Examinations — A final examination is required in each course upon completion of all unit work. The examination should be taken in the Correspondence Study Office but may, on approval, be taken elsewhere under the supervision of an approved proctor. Proctors approved are city or county superintendents of schools, principals of accredited senior high schools, and/or deans and department heads of colleges. Students in military service may arrange to take the examination under the supervision of the Education Officer of their station.

Fees — Fees for correspondence courses are listed in the catalog under "Fees and Charges" (see page 30). Fees are payable in advance and should accompany the application.

For application form and further information write to Director, Auburn University Correspondence Study Program.

Co-operative Education Program

The Co-operative Education Program provides opportunities for students to alternate quarters of academic study with quarters of experience in industry, education, business, and government positions.

The coordination of academic study and work experience combines theory and practice in the educational process. As a consequence, students find more meaning in their studies and their motivation is increased. This experience contributes to the development of a sense of individual responsibility. The student's judgment and maturity also develop more fully, and a better appreciation of the importance of human relations is gained. Since the employer pays the student a wage or salary during the experience quarters, this assists the student considerably in his educational expenses.

For all four-year curricula, the Co-operative Education Program is a five-year plan. A student must complete at least two quarters of the freshman year with an above-average scholastic record before he is placed with an employer. Transfer students are also considered for the program. Normally a student has seven experience quarters and during the senior year he remains in continuous residence in school. After entering Auburn a student may apply and begin participation in the program anytime providing six academic quarters remain in his chosen curriculum.

For five-year curricula (i.e. architecture and pharmacy) the Co-operative Education Program is a six-year plan.

The program is offered in all curricula of the Schools of Business, Engineering and Education. Students in the Applied Physics, Architecture, Art (Visual Design), Biological Sciences, Building Technology, Home Economics,

Industrial Design, Journalism, Mathematics, Pharmacy, Physics, Political Science, Pre-Law, and other curricula may also participate in the program. Upon completion of the program, certificates are awarded by the University.

Additional information and a booklet describing the program may be secured from the Director, Cooperative Education, Auburn University, Auburn, Alabama 36830.

University Regulations

Academic Regulations

Students pursuing academic programs must comply with regulations and follow procedures prescribed by the University. Regulations relating to registration, class attendance, physical education, military training, grading system, examinations, degree requirements, honors, and other academic matters are presented in the following pages.

Registration And Scheduling

General Requirements. Every student is required to be registered in Auburn University in the quarter of his graduation or in any other quarter when, in clearing an "incomplete" grade, working on a graduate thesis, engaged in any other endeavor relating to his normal progress as a student, he makes use of the instructional staff and the facilities of the University. A fee is charged for such registration. (See page 30.) Registration in a correspondence course through Auburn University satisfies this requirement.

A student may not be registered at another college or university concurrent with registration at Auburn University without prior permission from the student's dean.

Permit to Register. An undergraduate student entering Auburn University as an original or first-time student will receive his permit to register from the Admissions Office. A former Auburn University undergraduate student will obtain his permit to register from the Registrar's Office. If an undergraduate student has not attended Auburn University for a period in excess of three (3) years, he must submit a recent physical examination report on the Auburn University Infirmary form.

Re-admission of Former Students. Students who have previously attended Auburn University and desire to re-enter must secure a registration permit from the Registrar's Office. Students who have attended another institution for one (1) quarter or semester must be eligible to re-enter the institution attended. Students attending another institution for more than one (1) quarter or semester must also have earned an overall "C" average to be eligible to re-enter Auburn University. Two (2) official transcripts must be furnished to the Registrar's Office from the institution attended.

Calendar Periods for Registration. The periods designated for completing course requests, schedule distribution and fee payment, and final registration are listed in the University Calendar on pages 2-3. Students should acquaint themselves with these periods for necessary schedule planning and clearing of fees. Students not clearing fees during the designated periods will be subject to the late fee (see page 32). All currently enrolled undergraduates must register and clear fees for the following quarter during the registration period indicated in the University Calendar prior to the beginning of final exams.

A late fee is assessed all currently enrolled undergraduates who register during Final Registration at the beginning of the following quarter.

Late Registration. After the date specified in the University Calendar as the last day for final registration, no student may register except by permission of the dean. The load of a student who registers late shall be reduced at the discretion of the dean and an extra fee charge will be made. (See page 32.) No student will be registered after the tenth day of classes. Any deviation from this policy must have the approval of the Dean of Undergraduate Studies or Dean of the Graduate School.

Back Work and Substitution of Courses. A student's dean may make such substitutions as he deems necessary for courses in the student's curriculum. In arranging a student's work for each year the dean will require him to schedule first the back work of the lower class or classes, but where this would work a serious hardship on the student the dean may make such exceptions as he deems necessary.

Student Load. The maximum load for students enrolled in undergraduate curricula is 19 quarter hours. A normal quarterly load is from 15 to 19 hours. Upon approval of his dean, a student may schedule less than a normal load.

The maximum load may be exceeded only under the following circumstances:

- (a) The academic dean may approve up to 20 hours as a "convenient load."
- (b) Upon approval of his dean, a student may schedule an overload not to exceed 23 hours if, during his last residence quarter at Auburn University in which he carried 15 or more hours, he passed all work attempted and earned a grade point quotient of 1.5 or higher. A student who has scheduled fewer than 15 hours during an intervening quarter (or quarters) will retain the overload privilege if he has passed all work carried with a minimum grade point average of 1.5 in each intervening quarter. In special cases the dean may make exceptions to the 1.5 requirement by written notice to the Registrar.
- (c) Upon approval of his dean, a graduating senior who is ineligible to carry an overload may schedule a maximum of 23 hours if the overload will allow him to graduate in that particular quarter.

A student who registers for work in excess of his approved load may be required by his dean to drop the overload during the Schedule Adjustment Period. The student's load may also be reduced by the dean when circumstances seem to make it advisable.

Prerequisites. Prerequisite or corequisite requirements of courses are listed with the course descriptions in the University catalog. It is the responsibility of the student to know these requirements and to comply with them when registering. Any waiver of these requirements must be approved by the instructor concerned and/or his department head. In addition, the waiver of the junior standing prerequisite established for courses that may be taken for graduate credit must have the approval of the Dean of the Graduate School.

Curriculum Transfer. A student must have the approval of his dean to change his major. This procedure may be accomplished with the Dean's Office. If a student transfers from one academic school to another, the student must

secure a permit to change schools from the Registrar's Office. Instructions for completing the process will be provided by the Registrar's Office. A student may change schools during the periods of registration as prescribed in the University calendar. (See page 2-3.) A student who changes academic schools will be given instructions to obtain his academic folder from the former dean's office for use by the dean's office of the school in which he is to enroll.

Schedule Adjustment. A student must have the permission of his Dean to make any changes or adjustments in his course registration. The student will obtain permission from the Dean and follow the University procedure to consummate the desired change or adjustment. A service fee may be charged for any changes or adjustments that occur after the approved University period for Schedule Adjustment. (See page 32.) Refer to the section on Grading System (page 54) for assignment of grades for class withdrawals.

Auditing Privilege. Because of the heavy enrollment in most academic departments, the privilege of auditing courses is restricted. Auditing of a lecture course or the lecture part of a combined lecture and laboratory course may be granted with the approval of the student's dean and the head of the department in which the course is offered. The auditing privilege is rarely permitted in laboratory or combined lecture and laboratory courses.

Auditors must complete the regular registration process and are listed on class rolls, but are not required to participate in classroom discussions, take tests or final examinations, or make reports; no grades or credits may be received. Auditors who have not been admitted to the University must make application to, and secure a registration permit from the Admissions Office. Former students secure a registration permit from the Registrar's Office. Students registering as auditors (12 classification) must have their schedule approved by the Assistant Registrar. Auditors who are not regularly enrolled students will register on the last day of the final registration period. A fee (see Auditing Fee on page 32) will be charged for auditing a lecture course. Regularly enrolled students carrying 10 hours or more and members of the faculty may audit lecture courses, without payment of the auditing fee with approval of the head of the department in which the course is offered and the individual's dean; however, the regular registration process must be completed. A student may not change from audit to credit or from credit to audit after the schedule adjustment period.

Resignation. In the event a student wishes to resign from the University, he must first contact his dean. The resignation form must be completed as necessary and required. A student who pre-registers and clears fees but receives an academic suspension will automatically be resigned by the Registrar's Office if there is no possibility to clear the suspension. A student who receives an academic suspension but who may clear will not be resigned. However, if the student does not clear the academic suspension by the 10th class day, he will be resigned. All refunds of fees will be made by the Office of the Bursar in keeping with the University policy on refunds. (See page 34.)

After the date carried in the University calendar for mid-quarter, no student may resign from school and escape the penalty of failure. After this date, the dean shall contact the student's instructors to determine his scholastic standing at the time of resignation and report such standing to the Registrar. If the student is failing in over half his work, the number of hours reported as

failing will be counted as credit hours attempted and included in academic eligibility calculations. Those hours reported as passing will be dropped and will not be counted in the grade point calculations. Furthermore, when a student's total hours attempted exceed grade points earned by more than 21 at the end of his last quarter in residence prior to his resignation, the student's grades will be reviewed by his dean to determine if he has a C average for the quarter in which he is resigning. If the student does not have a C average, he will be placed on academic suspension.

When a student through illness or physical disability is forced to resign after mid-quarter, and when this condition has been the main factor in causing scholastic deficiencies, discretionary power in waiving the scholastic penalty shall rest with the student's dean. A student who is resigned for disciplinary reasons will retain the academic status he achieved immediately prior to the disciplinary action.

Class Attendance

The philosophy of the University is that the final grade for a course represents a measurement of the student's performance in achieving the objectives of the course. Absence from class sessions, in and of itself, should not influence the final grade.

The student shall be expected to carry out assigned work and to take all examinations. Failure to carry out these assignments or to take the examinations shall result in an appropriate reduction in grade. If a student, because of absences, fails to carry out a significant proportion of the assigned work, he may be dropped from the course and assigned a grade of "FA."*

Each instructor shall determine the policy regarding assigned work which he feels is best for his course. In developing this policy the instructor shall consider carefully the nature of the course, the maturity level of the students enrolled in the course, and the consequent level of flexibility which his policy will include. The policy, along with the instructor's requirements for announced and unannounced examination attendance, shall be presented to the class, preferably in writing, at the beginning of the quarter and will govern the actions of the instructor in the course.

It is expected that assigned work will be carried out. However, instructors will be expected to recognize and honor official University excuses which may be issued to groups or individuals for absences due to participation in authorized University activities (e.g., athletic teams, events of a traditional nature; e.g., the Hutsell Freshman Cake Race; or for absences directly related to the academic program, authorized field trips**), and to make allowances for student absences caused by illness or personal emergencies. Arrangements to make up missed work shall be initiated by the student. Such arrangements could result in delayed due dates for assignments or in "IN" or other deferred grades.

*The instructor shall give written warning to the student and make written notification of the situation to the student's dean. If, after written warning has been given, the student continues his absences and does not do the assigned work, the instructor may drop the student from the class with a grade of "FA". In such a case, the instructor shall be the judge, but shall report his action, in writing, to the student, the student's dean, and the Registrar.

**Field trips will be authorized by the department and dean of the school in which the course is taught. The instructor will issue an official excuse to each student participating in the field trip. Any student may decline participation in a given field trip and receive an appropriate compensating assignment if, following consultation with his instructor, it appears that the field trip would adversely affect his other academic work.

Excuses for student absences of a non-academic, extra-curricular nature will not be issued by the University but will be granted at the discretion of the individual instructor. Any evidence or request for consideration that the student may feel justifies his absence may, of course, be presented to the instructor for review.

The regularly accepted time for class procedure to begin shall be ten minutes after the hour. If the instructor does not appear within 20 minutes after the hour, students are permitted to leave the classroom without penalty. All classes shall be dismissed promptly on the hour.

Problems may be referred to the Dean of Undergraduate Studies for resolution.

In order that the University may have effective class days, it is University policy that all classes will meet as scheduled the last day before holidays and the first day after holidays as designated by the University.

A student absent from a final examination due to personal illness must obtain an excuse from the Director of the University Student Health Service in order to take a makeup examination. A student must obtain permission from the Dean of Undergraduate Studies to make up a final examination missed for any reason other than personal illness, or to make any change in his final examination schedule.

Students are discouraged from requesting excuses for the purpose of attending reserve military training since such requests are normally denied.

Examinations

General. Examinations are classified as: 1) final examinations at the end of each quarter; 2) special examinations; and 3) other course examinations as determined by the instructor. The Final Examination Schedule Policy is found on this page.

Announced quizzes in any undergraduate course will be administered at a regularly scheduled meeting of the course. Any departure from this regulation must be approved by the Dean of Undergraduate Studies. Grades in all subjects are reported to the student's parents or guardians at the end of each quarter.

A student absent from a final examination for any reason other than personal illness must obtain an excuse from the Dean of Undergraduate Studies in order to take the examination. Final examinations missed because of illness must be excused by the University Physician.

Mid-Quarter Deficiencies. Deficiencies are reported at the end of the fifth week in each quarter for freshmen.

Final Examination Schedule Policy. A final examination will be given in each undergraduate course. The examination will be administered during the hours specified in the quarterly examination schedule. Any departure from these regulations must be approved by the Dean of Undergraduate Studies.

The professor teaching a 600-level course shall determine whether a formal final examination is appropriate. If one is to be given, it shall be scheduled at a time during the final examination period which does not conflict with

scheduled examinations for other courses in which students in that course are enrolled. Generally, it is expected that the exam will be given at the time exams are scheduled for other classes meeting at the same hour.

No departure from the published examination schedule is permitted except as provided in the statements above. The University Examination Period is published in the Calendar (see pages 2-3). The detailed hour schedule will be distributed to the Faculty and published in the Plainsman after mid-quarter.

Special Examination Period and Permits. The first four (4) class days of each quarter are designated as the Special Examination Period. Permits to take missed examinations are obtained in the Registrar's Office. The student must present from the Dean of Undergraduate Studies or University Physician authorization for the Registrar to issue the special examination permit. The student after being issued the examination permit will pay the required fee at the Bursar's Office. The instructor will enter the assigned grade on the examination permit and return it to the Registrar's Office. (See page 34 for service fee.) Fees are not charged to a student absent from quarterly examinations on account of illness when reported by the University Physician. The Dean of Undergraduate Studies may waive the fee at his discretion for extenuating circumstances. Only one (1) fee charge is made for special examination permits regardless of the number of examinations to be taken.

Senior Privilege Examinations. A senior who fails one course at the end of a quarter in which all requirements for a degree would have otherwise been completed, or who fails *one* required course which will not be offered again until after his projected graduation quarter, may take a senior privilege examination at a time which is mutually agreeable to the student and teacher. The examination is to be considered an assessment of the student's mastery of the subject matter of the course as a whole; if he passes it, he will be assigned a grade "D" for the course.

Special Examinations for Students called to Military Service. Any student who is ordered to report for active duty with the armed services (as distinguished from summer camp requirements) on a date within the last 20 class days before the date of graduation as listed in the catalog, may, by producing a copy of his official orders, obtain written permission from his dean to take early final examinations on subject matter covered to date for full credit. Special examination permits will be issued by the Registrar's Office without charge.

Grading System

Final Grades. In credit courses, passing grades are A, B, C, D, and S. A grade of S (Satisfactory) may be assigned only to 699 and 799 courses, student teaching courses, and courses elected under the "S-U" option. **Failing grades** are F, Fail; XF, did not take the final examination and failing the course at the time of final examination; or WF, officially dropped by permission of the student's dean but failing at time of withdrawal; and FA, when in the judgment of the instructor a student shows a tendency toward irregularity in attendance, the instructor shall give written warning to the student and make written notification of the situation to the student's dean. If, after written warning has been given, the student continues his irregular class attendance,

the instructor may drop the student from the class with a grade of FA. In such case, the instructor shall be the judge, but shall report his action (using the Excessive Absence Drop form) to the student, the student's dean, and the Registrar.

Deferred Grades. An X is assigned if the student is passing but missed the final examination. If the student is absent from examination and also has other incomplete work, the grade of X must be assigned. (See Special Exam Permit, page 54.) IN is assigned when the student has cleared the final examination but has not completed all other work required during the quarter.

Grade Changes. Final Grades: If circumstances warrant a change of a final grade reported to the Registrar's Office, the grade may be changed only by written request of instructor concerned, with approval of instructor's department head and dean, which must be submitted to the Registrar. (See section above for final grades.) Deferred Grades: X (Absent Examination, passing) can be cleared only on official Special Examination Permit secured by the student from the Registrar's Office (See Special Exam Permit, page 34); IN (Incomplete) may be removed by written statement from the instructor (endorsement by the instructor's department head and dean not required). Deferred grades not cleared within the student's next residence quarter must be repeated if the course is required. If the deferred grade is not cleared within the next residence quarter, it is treated as a failing grade for grade point average computation.

Grade Assignment for Class Withdrawals. No penalty shall be assigned for a course dropped on or before the 15th class day of the quarter. (For courses with fewer than 5 meetings per week, 15 class days should not be confused with 15 class meetings.)

If a course is dropped after the first 15 days, but by the date of mid-quarter, the instructor shall assign a grade of W (passing) or WF (Failing) as the case may be. A course can be dropped with a W after mid-quarter only under unusual circumstances. When approval is granted by the student's dean for dropping the course under such circumstances, a W may be assigned only when the instructor indicates that the student is clearly passing the course; otherwise a grade of WF is assigned.

Satisfactory - Unsatisfactory (S-U) Grading Option. With the approval of his adviser and dean, a student may schedule a course under the S-U option if he has junior or senior standing, has a cumulative grade point average of 1.5 or better on a 3.0 scale, and has earned at least 30 hours of credit at Auburn University.

A student may not elect the S-U option for courses required in the freshman or sophomore years of his curriculum, courses constituting the major as defined by his curriculum, courses approved in the catalog as not eligible for election of the S-U option, or courses for which a conventional grade has been recorded.

A total of 20 credits may be earned on the S-U option at the rate of one course per quarter. The grade for a course taken under the option shall be recorded on the student's permanent record as an S or U. S and U grades shall not be considered in the determination of grade point averages; however, the

student should be aware that an S grade could only be interpreted as a grade of D or better and a U grade as a failure.

A grade of IN, X, XF, FA, W, or WF may be assigned in a course under the S-U option. If the grade of IN or X is cleared, the grade recorded on the student's permanent record shall be an S or a U. A grade of FA, W, WF, XF, and uncleared IN, or an uncleared X shall have its usual meaning.

A student who has received an S grade in a course and later changes his curriculum shall receive credit for the course in his new curriculum provided credit is normally accepted in the curriculum for the course.

A student who elects a course under the S-U option shall receive the same consideration, and assume the same responsibilities, in the course as any other student who elects the course. Courses may be elected under the S-U option without the prerequisites or the corequisites for the course, but the student should be advised that he may be placing himself under a severe handicap by taking a course under these conditions.

After the close of the schedule adjustment period, there shall be no change in the mode of grading (from S-U basis to the conventional basis or vice versa) of any student in any course.

Students electing the S-U option will be identified as such on the class rolls and instructors' grade sheets.

Academic Eligibility

Undergraduate Students Only

Auburn University may place a student on probation or suspend him at any time if he flagrantly neglects his academic work or makes unsatisfactory progress toward graduation.

Academic Probation. Any student enrolled at Auburn University will be placed on academic probation whenever the total number of hours he has attempted at Auburn University exceeds total grade points earned by more than 12, except that no entering freshman will be placed on academic probation on the basis of his first quarter's work at Auburn.

Clearing Probation. A student may clear a probation by reducing his grade point deficiency to 12 or fewer grade points.

Academic Suspension. A student on probation will be placed on academic suspension for two quarters whenever the number of hours he has attempted at Auburn University exceeds grade points earned by more than 21. However, such a student will not be placed on academic suspension at the end of a quarter in which he earns a 1.0 (C) average, but he will be continued on academic probation.

A student's first academic suspension will be for a period of two quarters, summer quarter being counted as any other quarter. A student will be re-admitted on academic probation following the expiration of his first suspension. A student who incurs a second academic suspension is placed on indefinite suspension and can be re-admitted only on special approval by the Admissions Committee on the basis of adequate evidence of ability, maturity and motiva-

tion. Generally, a student must be on indefinite suspension at least four quarters before his application for re-admission will be considered.

A student whose eligibility to register cannot be determined because of deferred grades may be permitted to register conditionally until his status is determined. Conditional grades must be cleared within two weeks of the beginning of the quarter.

No credit earned at another institution by a student on academic suspension from Auburn will be used in clearing a suspension or in meeting requirements for an Auburn University degree.

Suspensions incurred prior to implementation of the above regulations shall not be counted when determining a student's academic status.

A student who resigns after mid-quarter may be subject to academic suspension. (See "resignation" on page 51 for further information.)

School of Veterinary Medicine. Students enrolled in the School of Veterinary Medicine who fail to make a grade point average of 1.25 in any quarter will be placed on academic probation. Students on academic probation who fail to make a 1.25 in the following quarter may be dropped from the School of Veterinary Medicine. Students who make a grade of F on any course may be required to withdraw from the School of Veterinary Medicine. If readmitted such students may be required to repeat certain other courses in the curriculum for that quarter.

Students who are dropped under the above provisions are eligible for admission to other curricula provided they meet the general scholastic requirements for continuance in college. The scholastic penalties incurred while enrolled in the School of Veterinary Medicine will become a part of the student's record.

Classification

Each undergraduate student will be classified according to the number of quarter credit hours he has earned at Auburn University and other institutions as follows: Freshman, 47 or fewer; Sophomore, 48 to 95; Junior, 96 to 143; Senior, 144 or over.

A student who has been awarded one baccalaureate degree and pursues another course for a second baccalaureate degree will be classified as an undergraduate student.

The numbering sequence for identifying the classification of students for undergraduate programs are as follows: 1 Freshman; 2 Sophomore; 3 Junior; 4 Senior; 5 5th year for PY, AR, and VM; 10 Unclassified (non-degree students); 12 Special students and persons admitted as audits only. (6, 7, 8, 9, 11, and 13 are Graduate classifications.)

English Composition Requirements

All students are expected to maintain a reasonable standard of good English usage, oral and written. Instructors in all curricula are directed to insist on clear, effective, and accurate speaking and writing in all class work. No substitution for the freshman English requirement is permitted.

Credit in freshman English composition earned at another institution may be allowed on transfer as follows, except that no grade less than C will be accepted.

1. If the transfer student has fewer than three quarter hours of credit in freshman English composition, no credit is allowed. If he has three quarter hours credit in the first course of an English composition sequence, he must complete both EH 102 and 103.
2. If the transfer student has four quarter hours of credit in the first course of a three-course sequence, he must complete EH 102 and 103.
3. If the transfer student has either four or five quarter hours of credit in the first course of a two-course sequence, he must complete EH 103.
4. If the transfer student has three semester hours of credit in the first course of a two-course sequence, he must complete EH 103.
5. If the transfer student has earned eight or more quarter hours and has met the first year English composition requirement of the other institution, credit may be allowed for EH 101-102-103, provided the minimum of eight hours involves no duplication. A total of 12 hours may be accepted toward the graduation requirement when the 12 hours of work represents a continuous course sequence at one school. Students entering an undergraduate school at Auburn University after receiving a bachelor's degree from another accredited college or university are exempted from meeting these regulations.
6. No student failing a freshman English composition course at Auburn will be permitted to transfer credit from another school to offset that F, but must repeat the course in residence at Auburn.

All transfer students are directed to clear their freshman English composition credits with the Registrar as soon as possible after enrolling at Auburn University.

World History—Literature Requirements

One of the purposes of the University's Liberal Education Program is to give the student "an understanding of his culture and its backgrounds." Course sequences designed especially for this purpose are those in world history, world literature, and technology and civilization (see page 65). Students must earn 9 hours of credit in one of these sequences.

Credit in world history or literature earned at another institution may be allowed on transfer as shown below in meeting this particular requirement. The student's dean may require a C grade for a course to transfer.

1. If a transfer student has three or four quarter hours of credit in the first course of a three course sequence in world history or literature, he must complete HY 102 and 103 or EH 261 and 262.
2. If a transfer student has four or five quarter hours of credit in the first course of a two course sequence, he must complete HY 103 or EH 262.
3. If a transfer student has earned eight or more quarter hours in world history or another history area or world literature or another literature

area, and has completed the standard history or literature requirement of the other institution, he may be excused from this particular requirement in the Liberal Education Program.

4. If a student enters an undergraduate school at Auburn after receiving a bachelor's degree from an accredited university, he may be exempted from the world history - literature requirement unless his curriculum major or minor specifies one of the three sequences described in this section.

Physical Education Requirements

University Requirements. Physical education is required for three (3) consecutive quarters. Only one credit per quarter is permitted or transferable to meet the three (3) quarter requirement.

Unless otherwise approved by the student's dean, each student who lacks physical education must register for an activity course in the first and succeeding quarters of residence until all requirements are met or until he becomes 26 years of age.

Transfer Students. Students transferring from an institution not requiring physical education will have their physical education requirements reduced by the number of full-time quarters (15 hours credit per quarter passed) in residence at the former institution. Students who transfer from an institution requiring physical education will have their physical education requirements reduced by the number of quarters of physical education completed at the former institution.

Health Classification. A medical examination is required of all students before being admitted to physical activity classes. A card stating the physical condition of each student must be filed in the infirmary and the Department of Health, Physical Education and Recreation before assignment of activities can be approved.

Advanced Standing And Credit

Military Service Credit. Applicants who have served in the Armed Forces, upon submitting to the Registrar the official separation form (DD Form 214 and other DD Forms supporting military course attendance), may be allowed credit toward advanced standing for service experience as follows:

(1) Courses completed in military service programs at the college level insofar as they fit into the student's curriculum as required subjects or as electives, as approved by the dean concerned.

(2) Special service training not strictly organized as college courses, and other formal or informal off-duty training. Credit may be allowed toward advanced standing by the dean after review by the Registrar and the dean concerned of the official separation record and, as required, after passing with satisfactory scores or grades any field or subject examinations given through the Armed Forces Institute or by the department concerned. Credit for college level General Educational Development Tests is allowed as approved by the dean concerned, except that no credit is allowed in English.

(3) Correspondence courses. Credit may be allowed for college level courses completed by correspondence through the Armed Forces Institute, institutions approved by the Armed Forces Institute, and other accredited institutions as approved by the dean concerned.

(4) Students who have had active military service may receive credit in physical education as follows: for less than six months, no credit; for six months to one year, one quarter hour in Foundations of Physical Education, HPR 101; for more than one year, two (2) quarter hours (less any completed prior to military service) plus one (1) quarter hour in swimming if the student passes the departmental proficiency test.

Advanced Placement Tests. (See page 21, "Advanced Standing Program.")

College Level Exam Program (CLEP). Credit is allowed for the CLEP of the College Entrance Examination Board. A minimum score of the 50th percentile is required for academic credit to be allowed for both the General and Subject Examinations. General Examination Credit is allowed as follows at the discretion of the student's academic dean:

Humanities—Nine hours of elective credit

Mathematics—Five hours of credit for MH 159

Natural Science—Nine hours of elective credit

Social Science (History)—Nine hours of credit for HY 101, 102, 103

English Composition—No credit. However, a proficiency examination will be administered by the English Department upon request to determine the number of credits that may be allowed.

The number of credits allowed for satisfactory performance on the General Examination will be reduced by the amount that the student has previously earned in the subject matter areas covered by the examinations.

Subject Examinations—Credit is allowed insofar as the course for which the examination is given is applicable to the student's curriculum, provided the subject matter department in the University agrees that the examination reasonably covers the material normally included in the course for which the examination is being substituted.

Departmental Tests (Proficiency Examination). Proficiency Examinations similar to final examinations may be administered by a department upon application of the individual student. A student who has pursued college-level work in secondary school, in class or on a tutorial basis, or through private study, may make application for a proficiency examination. If he earns a satisfactory grade, he will be eligible for placement in an advanced course and for credit in the subject covered by the examination.

Dean's List

A full-time student (one enrolled for a minimum of 15 quarter hours) passing all credit hours of work carried during a quarter and attaining a scholastic record within the upper five per cent of the records attained by the full-time students enrolled in his school may be designated an honor student for that quarter. The honor attained will be recorded on the Dean's List and on the student's permanent record.

Degree Requirements

The University Registrar will clear for undergraduate graduation the following: total hours and graduation grade point requirement, freshman English, and physical education. All other requirements are cleared by the respective dean of the school in which the student will be awarded the degree.

To qualify for graduation, a student must complete the courses and hours specifically required and accepted for his curriculum with a grade point average of 1.0 (C). A student who transfers from another institution must earn grade points equal in number to the additional hours required at Auburn University for completion of the curriculum. If courses by correspondence and extension are accepted, the number of grade points allowed will not exceed the number of credit hours so completed.

Not more than 10 quarter hours of the final year's work may be obtained through extension or correspondence courses, or both, unless the student has completed a full load in residence previously for one full session of 36 weeks, in which case credit will be allowed for a total of 18 quarter hours in either extension or correspondence, or a combination of the two. All credit hours earned by correspondence or extension will be counted as any other credit hours earned toward meeting graduation requirements but will not be included in the calculation for continuation in residence.

Seniors who are candidates for degrees must remove all failures and deferred grades and have cleared all special examinations by the end of the tenth class day of the graduating quarter.

University policy requires that all work and final examinations for graduating seniors be completed and in the Correspondence Study Office five weeks prior to the graduation date.

Degrees are conferred at Commencement Exercises held at the close of each quarter. Students who wish to graduate in absentia should contact the Dean's Office or the Registrar's Office at least a week prior to the graduation date.

The graduation fee (page 33) must be paid at the beginning of the quarter of graduation at the Bursar's Office.

No student will be issued a diploma or statement of credits if he is in default on any payment due the University or any school or division thereof.

Residence Requirement. To obtain a bachelor's degree from Auburn University, a student must earn a minimum of 45 hours in residence at the institution. As a general rule, the 45 hours must be taken during his final year and in the school or curriculum of graduation. However, the student's dean may waive the final year's residence in a specific school or curriculum and may also approve up to 20 hours earned elsewhere during his final year. In any case the student must complete a total of 45 hours in residence at Auburn University.

Second Degree. A minimum of 45 quarter hours and 45 grade points and 36 weeks of residence is required for a second baccalaureate degree by a graduate of Auburn University. The minimum requirements for a second baccalaureate degree for a graduate of another institution are completion of the hours required in the final year of the curriculum with an equal number

of grade points and 36 weeks of residence at this institution. A minimum of 45 quarters and 36 weeks of residence is required for a master's degree.

Graduation Honors

Students clearing graduation requirements with exceptionally high scholastic records who have completed in residence at Auburn University not fewer than six quarters of the work required in their curricula are graduated with distinction. The distinction attained will be recorded on the student's diploma and placed on his permanent record.

A transfer student who has completed at least three quarters of work in residence at Auburn University is eligible for graduation honors if he meets both of the following requirements: (1) his grade point quotient on all work taken in residence at Auburn University meets the minimum requirements for the honor and (2) his overall grade point quotient on all work taken in residence at Auburn University and elsewhere meets the minimum requirements for the honor.

A transfer student may not be graduated with a degree of distinction higher than that for which he would be eligible on the basis of his Auburn University record, and where his overall average is lower than his Auburn University record, the degree of distinction earned will be determined by his overall grade point quotient.

A student whose record at Auburn University fails to meet the requirements established for one of the degrees of distinction may not be graduated with honors regardless of his record elsewhere.

In determining graduation honors, all work attempted in residence except remedial subjects and subjects cleared with the "S" (satisfactory) grade, will be used in the calculations. Where transfer credits are considered, calculations will be based on the grade point values in use at Auburn University.

The grades of distinction and requirements are: With Honor, a grade point quotient of at least 2.4; With High Honor, a grade point quotient of at least 2.6; and With Highest Honor, a grade point quotient of at least 2.8.

Off-Campus Credit

Extension and Correspondence. The following regulations govern extension and correspondence courses: (1) Credit for undergraduate courses in extension and/or correspondence in the major subject or for requirements for the baccalaureate degree shall not exceed, including transfer credits so earned, 10 percent of the total credit required. (2) Credit hours earned by correspondence or extension will be counted as any other credit hours earned toward meeting the requirements for graduation, but will not be included in the calculation for continuation-in-residence. Grade points will be assigned to such work toward meeting the requirements for graduation, but in no case will the number of grade points exceed the number of credit hours so earned. (3) Credit for extension and correspondence courses to be taken at Auburn or elsewhere must be approved in advance by the student's dean. (4) No student in residence may enroll for a correspondence course if he can schedule the course or a suitable substitute. (5) No student shall receive credit for correspondence work which, with courses taken in residence, makes a total load exceeding the maximum allowed under college regulations.

In addition to the above, students taking work under the Auburn University Correspondence Study Program are subject also to its regulations as outlined on page 46.

Information, course listing, and application form should be requested from the Correspondence Study Director, Correspondence Study Program, School of Education, Auburn University.

Off-Campus Center Credit. Permission to take work at a university off-campus center is at the discretion of the dean and within the established relationships between the center and the comparable school or college in the parent university of the center.

Auburn University At Montgomery

Students may take course work on either main campus or the Montgomery Branch. A student identified as an undergraduate student on either of the campuses must obtain a special transient form from the Registrar's Office before registering on the second campus. Graduate students should contact the Graduate School Registrar for information on registering. Due to the small differences in some curricula and courses, the amount of transfer credit and advanced standing will be determined by the appropriate academic unit and the Registrar at the campus to which the student transfers.

Dual registration for taking course work on both campuses concurrently may be permitted.

Additional information may be obtained from the Registrar's Office of either campus.

Special Regulations

For complete information regarding all Special Regulations, see "Rules and Regulations for Students" in *The Tiger Cub*, the student handbook.

Automobile Registration

Registration of four-wheel motor vehicles will be a part of the academic registration procedure at the beginning of the Fall Quarter each year for all undergraduate and graduate students that are permitted to bring cars to Auburn and will be part of the registration procedure at the beginning of the Winter, Spring and Summer Quarters for all students not already registered.

Students who bring unregistered cars, scooters or motorcycles on the campus after any registration period must register them at the University Security Office, Department of Buildings and Grounds, immediately after arrival on the campus. Faculty and staff members shall register their cars at the University Security Office. Failure to register a four-wheel vehicle, to use the proper decal and to park in the proper zone will constitute a violation and subject the violator to certain penalties.

Freshmen will be permitted to bring cars to Auburn, but unless required for commuting, they cannot be operated on the Campus during certain hours of each week day as prescribed in "Traffic and Parking Regulations". Generally,

those staying or living one-half mile or farther beyond the edge of the Campus will be considered commuters.

Bicycles must be operated in accordance with Alabama State Laws including lights if operated at night. At buildings where racks are provided they must be parked in these racks.

Junior, Sophomore and Freshman commuters must register for zone "D" and are not permitted to park or operate a vehicle on the main campus during normal school hours.

The above is general information subject to modification by the beginning of the Fall Quarter, 1972. For specific up-to-date information regarding designated parking area, traffic regulations and controls, violations and penalties, secure a copy of the "Parking and Traffic Regulations" from the University Security Office.

Discipline

Each student, by act of registration, accepts an obligation to obey all rules and regulations.

Students are expected to conduct themselves along the lines of good citizenship by obeying the laws of the United States, the State of Alabama, the City of Auburn, and the University. Enrollment as a student in no way exempts any person from penalty in case of violation of local, state or national laws. (See Student Handbook for detailed regulations relative to discipline.)

Liberal Education Program

AS STATED on page 9 of the catalog, the University's undergraduate instructional program requires that each student complete a component of general studies in addition to the requirements of his School or departmental major. This component is divided into a "foundation year" of course work in world history or literature, natural science, mathematics or philosophy, and physical education, and is to be taken during the lower-division years, primarily at the freshman level. A certain number of hours must also be completed in elective courses lying outside the student's major area; these are to be completed, in part at least, during the upper-division years.

The goals of this "experience in breadth" are to some extent intangible: the development in the student of the values of tolerance, intellectual honesty, and a capacity for reflective judgment. More specifically, it is hoped that the student will acquire also an ability to order his thoughts in a clearly expressed and reasoned manner; attain a grasp of the scientific method and discipline; develop some understanding of his culture and its backgrounds; and come to perceive the vital issues of our common life as citizens in a complex and changing world.

The minimal University requirements for all students are listed below; however, individual Schools and departments may increase the number of hours in this component of their undergraduate programs, and the student should consult the appropriate curriculum model in his School for complete requirements.

Requirement	Hours	Option
English Composition EH 101-2-3 (3-3-3)	9	None
History or Literature	9	World History 101-2-3 (3-3-3) or Technology & Civilization 204-5-6 (3-3-3) or World Literature (EH) 260-1-2 (3-3-3)
Natural Science	minimum of 10	Biology 101-2-3 (5-5-5) 101-4 (5-5) Chemistry 103-4 (5-5), 101-102-104 (2-3-5) Geology 101-2 (5-5) Physics 220-1-2 (4-4-4) 204-5-6 (5-5-5)
Mathematics or Philosophy	minimum of 5	Mathematics 100 (5), 159-161 (5-5), 160-161 (5-5) Philosophy 202 (5), 210 (3), 211-212 (3-3), 214 (3), 216 (3).
Physical Education	3	See page 290 for the various options for meeting this requirement offered by the Department of Health, Physical Education and Recreation.
Electives	minimum of 20	A minimum of 20 additional hours of liberal education studies are to be taken by each student; these will consist of course-work in two broad academic areas other than that in which his own major field lies (Human- ities and Fine Arts, Social Sciences, Mathe- matics and Natural Science), with no less than one course in each area.

School of Agriculture

E. V. SMITH, *Dean*

CHARLES F. SIMMONS, *Associate Dean*

R. D. ROUSE, *Assistant Dean*

THE SCHOOL OF AGRICULTURE prepares students for careers in agriculture and related professions. Courses provide a broad foundation in the basic sciences, a general knowledge of the applied sciences, and a reasonable number of cultural subjects. Most of the basic science courses are given in the freshman and sophomore years and serve as a basis for a better understanding of the applied or more practical subjects which are usually taken in the junior and senior years.

A curriculum is offered in Agricultural Science with majors in Agronomy and Soils, Animal Science and Dairy Sciences, Poultry Science, Horticulture, and Agricultural Journalism. Other curricula are offered in Agricultural Business and Economics; Agricultural Engineering; Biological Sciences, with majors in Botany, Fisheries Management, Wildlife Management, Entomology, Zoology, and Marine Biology; Food Science; Forest Management; Ornamental Horticulture; and Wood Technology. If a student is permitted to major in a field where the courses are not prescribed in the catalog he should consult with the head of the department concerned.

The School of Agriculture also furnishes the subject matter training in Agriculture for the curriculum for training teachers of Vocational Agriculture.

Transfer credit will not normally be allowed for any course passed with a grade lower than C at any other college or university.

Only on the basis of validating examinations by the student will transfer credit in agriculture subjects be accepted from colleges where instruction in these subjects is usually done by faculty members who do not hold graduate degrees in the major area of their instructional responsibilities. Arrangements for validating examinations must be made with the Dean of Agriculture in the first quarter of the student's enrollment in the School of Agriculture at Auburn and the examinations must be completed before the middle of the second quarter.

Curriculum in Agricultural Science (AG)

FRESHMAN YEAR

First Quarter

BI 101 Prin. of Biology	5
EH 101 English Composition	3
HY 101 World History	3
*MH 160 Pre-Cal. w. Trig.	5
†Basic ROTC	1

Second Quarter

BI 102 Plant Biology	5
CH 103 Fund. Chem. & Lab.	5
EH 102 English Comp.	3
HY 102 World History	3
†Basic ROTC	1

Third Quarter

CH 104 Fund. Chem. & Lab.	5
EH 103 English Composition	3
HY 103 World History	3
MH 161 An. Geom. & Cal.	5
†Basic ROTC	1

SOPHOMORE YEAR

ADS 200 Intr. An. & Dairy Sciences	5
BI 103 Animal Biology	5
PS 204 Fd. of Physics	5
†Basic ROTC	1
PE 101 Fd. of Phys. Ed.	1

AS 202 Agr. Economics I	5
AY 201 Prin. Grain Prod'n.	5
CH 207 Org. Chem. & Lab.	5
†Basic ROTC	1
PE 102 Begin. Swim.	1

ADS 204 An. Biochem. & Nutr.	5
HF 201 Orchard Mgt.	5
Elective	5
†Basic ROTC	1
PE From Group II	1

JUNIOR YEAR

First Quarter	
PH 301 Gen. Poultry	5
SC 202 App. Sp. Comm.	3
**Agr. Eng. Elective	5
Elective	5

Second Quarter	
BY 306 Fund. Plant Phys.	5
BY 309 Gen. Plant Path.	5
JM 315 Agr. Journalism	3
Elective	5

Third Quarter	
AY 304 General Soils	5
HF 308 Veg. Crops	5
**Agr. Eng. Elective	5
Elective	3

SENIOR YEAR

AY 401 Prin. Forage Prod.	5
FY 315 Farm Forestry	5
Elective	5
Elective	3

AS 301 Agr. Marketing	5
AY 404 Fiber & Oil Crops	5
Elective	5
Elective	3

ADS 401 Swine Production	5
AS 401 Farm Management	5
ZY 402 Econ. Entomology	5
Elective	3

Total — 210 quarter hours

*Credit toward a degree in any curriculum in the School of Agriculture will not be allowed for a mathematics course at a level lower than that specified in the curriculum. However, students who are not prepared to take the prescribed courses may take a lower level course without degree credit.

**To be selected from AN 350, 351, 352, and 353.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Agronomy And Soils

This major is for those students interested in the crop or soil sciences. For students with a keen interest in biology, chemistry, physics or earth sciences, Agronomy offers a great opportunity to pursue further these inclinations and abilities. With the rapid increase of the world's population and the accompanying world-wide demand for more food and fiber, the crop and soil sciences are now even more important than ever before.

Courses are designed to prepare Agronomy graduates for several major areas of endeavor: (1) the chemical industry, producers of fertilizer, herbicides, and other agricultural chemicals; (2) farm-advisory agencies such as soil-testing laboratories and other private consultants; (3) public farm-advisory agencies such as the Agricultural Extension Service or the Soil Conservation Service; (4) research agencies of corporations, U.S. Department of Agriculture, colleges and universities, and State Agricultural Experiment Stations.

Major in Agronomy and Soils (AY)

FRESHMAN YEAR

First Quarter	
CH 103 Gen. Chem. & Lab.	5
MH 160 Pre-Cal. w. Trig.	5
HY 101 World History	3
EH 101 English Comp.	3
†Basic ROTC	1

Second Quarter	
BI 101 Prin. of Biology	5
CH 104 Gen. Chem. & Lab.	5
HY 102 World History	3
EH 102 English Comp.	3
†Basic ROTC	1

Third Quarter	
BI 102 Plant Biology	5
MH 161 An. Geom. & Cal.	5
HY 103 World History	3
EH 103 English Comp.	3
†Basic ROTC	1

SOPHOMORE YEAR

ADS 204 An. Biochem. and Nutrition	5
BI 103 Animal Biology	5
CH 207 Organic Chem. & Lab.	5
†Basic ROTC	1
PE 101 Fd. of Phys. Ed.	1

AY 201 Prin. of Grain Prod.	5
CH 208 Org. Chem. & Lab.	5
GL 101 Geology	5
†Basic ROTC	1
PE 102 Begin. Swim.	1

PS 204 Physics	5
ADS 200 Intr. An. & Dairy Sciences	5
AY 304 Gen. Soils	5
†Basic ROTC	1
PE From Group II	1

JUNIOR YEAR

AN 350 Soil & Water Tech.	5
AS 202 Agricultural Economics I	5
BY 306 Fund. of Plant Physiology	5
SC 202 App. Sp. Comm.	3

AY 406 Com. Fertilizers	3
HF 308 Vegetable Crops	5
*Elective	10

ZY 300 Genetics	5
AY 415 Soil Morphology	5
JM 315 Agr. Journalism	3
Elective	5

SENIOR YEAR		
First Quarter	Second Quarter	Third Quarter
AS 401 Farm Mgt. _____ 5	AY 404 Fiber and Oil Crops _____ 5	AY 402 Soil Fertility _____ 5
AY 401 Prin. of Forage Prod. _____ 5	BY 309 Plant Pathology _____ 5	ZY 402 Econ. Ent. _____ 5
FY 313 Farm Forestry _____ 5	Elective _____ 8	Elective _____ 8
Elective _____ 3		

Total — 210 quarter hours

*The student must take at least five hours from AN 351, 352, 353, and 454; and nine hours of electives must come from Humanities and Fine Arts, and Social Sciences.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Animal And Dairy Sciences (ADS)

This curriculum is designed to qualify the graduate in the basic and applied sciences in preparation for a future in the management of animal production units; for work with governmental and private agricultural agencies; for entering the field of processing dairy products and meats; for pursuit of scientific investigations in the field of animal agriculture; and for teaching.

A student majoring in Animal and Dairy Sciences may elect a Terminal Degree Option or a Graduate Preparatory Option and will, with the assistance and approval of his adviser, develop a program of study in accordance with individual needs and interests from lists of approved elective courses.

By the choice of suitable electives, students in The Terminal Degree Option can prepare themselves to become (1) owners or managers of livestock farms; (2) feedlot managers; (3) livestock buyers and graders; (4) agricultural communication workers; and, (5) representatives for animal agri-businesses.

Students are encouraged to take the Graduate Preparatory Option if they anticipate the possibility of advanced study beyond the B. S. degree. Advanced study is necessary in preparing for most positions in teaching, extension education and research in universities and animal allied industries.

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
ADS 101 Man's Food _____ 3	HY 101 World History _____ 3	ADS 200 Intr. An. & Dairy Sci. _____ 5
EH 101 English Comp. _____ 3	EH 102 English Comp. _____ 3	CH 207 Organic Chem. _____ 5
CH 103 Fund. of Chem. & Lab. _____ 5	CH 104 Fund. of Chem. & Lab. _____ 5	EH 103 English Comp. _____ 3
MH 160 Pre-Cal. w. Trig. _____ 5	MH 161 An. Geom. & Cal. _____ 5	HY 102 World History _____ 3
PE 101 Fd. of Phys. Ed. _____ 1	PE 102 Begin. Swim. _____ 1	PE From Group II _____ 1
†Basic ROTC _____ 1	†Basic ROTC _____ 1	†Basic ROTC _____ 1

SOPHOMORE YEAR		
BI 101 Prin. of Biology _____ 5	BI 102 Plant Biology _____ 5	ADS 309 Live An. Eval. _____ 3
CH 208 Organic Chem. & Lab. _____ 5	ADS 204 Animal Biochem. & Nutr. _____ 5	BI 103 Animal Biology _____ 5
HY 103 World History _____ 3	SC 202 App. Sp. Comm. _____ 3	ADS 302 Feeds & Feeding _____ 3
PG 211 Psychology I _____ 3	JM 315 Agr. Journalism _____ 3	BY 300 General Microbiol. I _____ 5
†Basic ROTC _____ 1	†Basic ROTC _____ 1	†Basic ROTC _____ 1

JUNIOR YEAR		
ADS 406 Anim. Reproduction _____ 5	ADS 403 Animal Breeding _____ 5	AY 304 General Soils _____ 5
AS 202 Agr. Economics I _____ 5	ADS 408 Adv. An. Nutr. _____ 5	ZY 402 Economic Ento. _____ 5
ZY 300 Genetics _____ 5	VM 421 Gen. An. Physio. _____ 5	PS 204 Found. of Physics _____ 5
Electives** _____ 3	Electives** _____ 3	Electives** _____ 3

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

**A minimum of 10 hours must be completed from among ADS 401, ADS 402, or ADS 404; and 10 hours from AY 201 or AY 401, and AN 351 or AN 352. Other electives will be selected with the approval of the student's adviser.

SENIOR YEAR		
First Quarter	Second Quarter	Third Quarter
AS 401 Farm Management5	ADS 420 Seminar1	Electives**16
Electives**13	Electives**16	

Total — 210 quarter hours

†Students may choose 6 hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

**A minimum of 10 hours must be completed from among ADS 401, ADS 402, or ADS 404; and 10 hours from AY 201 or AY 401, and AN 351 or AN 352. Other electives will be selected with the approval of the student's adviser.

Horticulture (HF)

The Horticulture major is designed to prepare the student for a future in the fruit or vegetable industry. Horticulture graduates find careers in management of fruit and vegetable production units; as field representatives and management personnel for canning and freezing companies, seed firms, and wholesale or retail produce marketing firms; as technical or sales representatives for manufacturers of fertilizers, farm chemicals, and farm equipment; and as regulatory or technical personnel in federal or state agencies. Advanced study in Horticulture leads to professional positions in teaching, research, or extension.

Major in Horticulture (HF)

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
EH 101 English Comp.3	EH 102 English Comp.3	EH 103 English Comp.3
BI 101 Prin. of Biology5	BI 102 Plant Biology5	MH 161 An. Geom. & Cal.5
MH 160 Pre-Cal. w. Trig.5	HY 101 World History3	HY 102 World History3
HF 101 Intr. to Hort.1	CH 103 Fund. Chem.5	CH 104 Fund. Chem.5
†Basic ROTC1	& Lab.5	& Lab.5
PE 101 Fd. of Phys. Ed.1	†Basic ROTC1	†Basic ROTC1
	PE 102 Begin. Swim.1	PE From Group II1

SOPHOMORE YEAR		
HY 103 World History3	AS 202 Agr. Economics I5	HF 201 Orchard Mgt.5
BI 103 Animal Biology5	HF 224 Plant Production5	CH 207 Organic Chem.5
HF 221 Landscape Gardening5	JM 315 Agr. Journalism3	& Lab.5
SC 202 App. Sp. Comm.3	GL 101 Geology5	PS 204 Foundations of Physics5
†Basic ROTC1	†Basic ROTC1	†Basic ROTC1

JUNIOR YEAR		
ZY 300 Genetics5	HF 308 Vegetable Crops5	BY 309 Plant Pathology5
AN 350 Soil and Water Technology5	AY 304 General Soils5	AY 402 Soil Fertility5
BY 306 Fund. of Plant Physiology5	AS 301 Agr. Marketing5	Electives8
Elective3	Elective3	

SENIOR YEAR		
HF 401 Commercial Veg. Crops3	HF 402 Storage, Packaging, and Marketing Veg. Crops3	ZY 402 Economic Ento.5
HF 404 Fruit Growing5	Agr. Engineering5	Electives8
AS 401 Farm Management5	Elective5	HF 406 Nut Culture5
Elective5	Elective3	
	HF 405 Small Fruits5	

Total — 210 quarter hours

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Major in Poultry Science (PH)

A program is offered with the option of science or business. In most cases students anticipating study beyond the B. S. degree should choose electives for the science option. The electives in the business area provide the student opportunity to prepare for sales, service, and related agribusiness professions.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 160	Pre-Cal. w. Trig. — 5	EH 101	English Comp. — 3	HY 101	World History — 3
CH 103	Fund. of Chem. & Lab. — 5	CH 104	Fund. of Chem. & Lab. — 5	EH 102	English Comp. — 3
BI 101	Prin. of Biology — 5	BI 102	Plant Biology — 5	BI 103	Animal Biology — 5
†Basic ROTC	— 1	MH 161	An. Geom. & Cal. — 5	GL 101	Int. Geology I — 5
PE 101	Fd. of Phys. Ed. — 1	†Basic ROTC	— 1	†Basic ROTC	— 1

SOPHOMORE YEAR

HY 102	World History — 3	HY 103	World History — 3	ADS 204	An. Biochemistry & Nutrition — 5
EH 103	English Comp. — 3	SC 202	App. Sp. Comm. — 3	PS 204	Fd. of Physics or
PH 301	General Poultry — 5	AS 202	Agric. Economics I — 5	PS 205	Intr. Physics* — 5
CH 207	Organic Chem. & Lab. — 5	BY 220	Intr. Microbiology or	PG 212	Psychology II — 3
†Basic ROTC	— 1	BY 300	Gen. Microbiol-ogy I* — 5	†Basic ROTC	— 1
PE 102	Begin. Swim. — 1	†Basic ROTC	— 1	Elective	— 3
		PE	From Group II — 1		

JUNIOR YEAR

PH 302	Poultry Meat Prod. — 3	RSY 261	Rural Sociology — 5	AS 301	Agri. Marketing — 5
EH 304	Technical Writing — 3	ZY 300	Genetics — 5	SC 273	Group Prob. Solv. through Discussion — 5
AY 304	General Soils — 5	Electives	— 8	Electives	— 8
PA 211	Intr. to Deductive Logic — 3				
Elective	— 5				

SENIOR YEAR

First Quarter		Second Quarter		Third Quarter	
PH 405	Poultry Feeding — 3	PH 408	Poultry Diseases & Parasites — 5	PH 411	Poultry Marketing — 3
ZY 402	Economic Entomology or	AS 401	Farm Management — 5	PH 404	Poultry Management — 5
ZY 411	General Parasitology — 5	Electives	— 8	Electives	— 9
Electives	— 8				

Total — 210 quarter hours

*Students choosing the science option should take BY 300 and PS 205 in order to further prepare for more work in these areas.

Of the 47 hours of electives 30 must be selected from the list of approved electives shown below.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

APPROVED ELECTIVES

Business Option:		Science Option:	
AS 304	Agric. Finance — 3	BY 401	Biological Statistics — 5
AS 403	Agric. Prices — 3	CH 105	Fd. of Chem. III — 3
AS 405	Agric. Policy — 3	CH 105L	Gen. Chem. Lab. — 2
AS 410	Agric. Bus. Mgt. — 3	CH 208	Organic Chemistry — 5
AN 353	Farm Bldg. Tech. — 5	PH 406	Incubation & Brooding — 3
ACF 211	Prin. of Accounting I — 5	PH 407	Poultry Problems — 3
ACF 212	Prin. of Accounting II — 5	PH 409	Poultry Problems — 3
ACF 314	Income Tax Acct. — 5	PH 410	Poultry Breeding — 3
MN 341	Business Law — 5	PH 423	Biological Rhythms — 5
EC 350	Labor Economics — 5	PS 206	Intr. Physics — 5
EC 360	Money & Banking — 5	ZY 301	Comparative Anatomy — 5
EC 446	Business Cycles — 5	ZY 302	Vertebrate Embryology — 5
EC 465	Public Finance — 5	ZY 409	Histology — 5
PH 406	Incubation & Brooding — 3	ZY 424	Animal Physiology — 5
PH 407	Poultry Problems — 3	ZY 429	Quantitative Genetics — 5
PH 409	Poultry Problems — 3	FL 121-122	Elementary French — 10
PH 410	Poultry Breeding — 3	FL 131-132	Elementary Spanish — 10
SC 270	Group Leadership — 3	FL 151-152	Elementary German — 10
SY 204	Social Behavior — 5	FL 171-172	Elementary Russian — 10
ZY 302	Vertebrate Embryology — 5		
ADS 401	Swine Production — 5		
ADS 402	Beef Cattle Production — 5		
ADS 101	Man's Food — 3		
RSY 362	Community Organization — 5		

Agricultural Business and Economics

The curriculum in Agricultural Business and Economics is for both those students who plan a career in business closely related to agriculture, and for

those interested in the economics of agricultural production and marketing and in public policies affecting agriculture. The curriculum is administered through a faculty advisory system wherein individual student programs of study are developed in accordance with individual student needs and interests. The need for broad training, rather than narrow specialization, is emphasized.

The curriculum not only combines both business and technical agricultural courses, but through selection of electives it provides an opportunity for students to emphasize training in agribusiness, in agricultural economics, in humanities, or in selected production fields. The curriculum leads to a degree of Bachelor of Science in Agricultural Business and Economics.

The demand for graduates who have both business and applied agricultural training is increasing. In both public and private agencies, increasing attention to rural economic and social problems points to enlarged opportunities for qualified workers in teaching, research, sales, public relations, services, administration, and private employment in these fields. By properly selecting electives, students may prepare themselves to become (1) owners or managers of firms that produce, process, or market agricultural products; (2) teachers, research workers, or educational workers in the field; (3) public officials in the capacity of farm management or marketing specialists, commodity analysts, market news reporters, inspectors, credit analysts, etc.; or (4) employees of business firms that handle agricultural products or that service agricultural production and marketing firms.

Curriculum in Agricultural Business and Economics (AS)

FRESHMAN YEAR

First Quarter

EH 101 English Comp.	3
MH 160 Pre-Cal. w. Trig.	5
BI 101 Prin. of Biology	5
HY 101 World History	3
PE 101 Fd. of Phys. Ed.	1
†Basic ROTC	1

Second Quarter

EH 102 English Comp.	3
MH 161 An. Geom. & Cal.	5
CH 103 Fund. Chem.	5
& Lab.	5
HY 102 World History	3
LY 101 Use of Library	1
†Basic ROTC	1

Third Quarter

EH 103 English Comp.	3
CH 104 Fund. Chem.	5
& Lab.	5
BI 102 Plant Biology	5
HY 103 World History	3
PE 102 Begin. Swim.	1
†Basic ROTC	1

SOPHOMORE YEAR

ADS 204 Animal Biochem.	5
& Nutrition	5
AS 202 Agr. Economics I	5
BI 103 Animal Biology	5
PE From Group II	1
†Basic ROTC	1

ACF 211 Princ. of Acct.	5
PO 209 Intr. Am. Gov't	5
PS 204 Foundations of	5
Physics	5
†Basic ROTC	1

SC 202 App. Sp. Comm.	3
EC 274 Bus. & Econ. Stat. I	5
ACF 212 Prin. of Acct.	5
RSV 261 Rural Sociol.	5
†Basic ROTC	1

JUNIOR YEAR

ADS 303 Livestock Prod.	5
AY 307 Gen. Soils	5
EH 345 Bus. and Prof.	5
Writing I	5
Elective	3

AS 301 Agr. Marketing	5
PH 301 Gen. Poultry	5
MN 341 Business Law	5
Elective	3

AN 351 Agr. Mach. Tech.	5
or*	
EC 360 Money and Banking	5
AS 306 Agr. Econ. II	5

SENIOR YEAR

EC 456 Inter. Macro-econ.	5
AS 410 Agr. Bus. Mgt.	3
Electives	10

AY 401 Forage Prod'n. or	
AY 201 Grain Prod'n.	5
FY 313 Farm Forestry	5
AS 403 Agr. Prices	3
AS 490 Senior Seminar	1
Electives	5

AS 401 Farm Management	5
AS 405 Agr. Policy	3
Electives	8

Total — 210 quarter hours

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*AN 350, AN 352, AN 353 or AN 354 may be substituted.

RECOMMENDED ELECTIVES

Electives will be selected in consultation with faculty advisers based on student needs and interests. However, one elective course must be taken in each of two broad academic areas (humanities & fine arts, mathematics, and natural sciences).

Group 1			
ADS 302 Feeds & Feeding	3	AS 412 Economic Aspects of Water	5
ADS 310 Meat and Meat Products	5	EC 452 Comp. Econ. Systems	5
AN 350 Soil & Water Tech.	5	AS 460 Intr. to Econometrics	5
AN 351 Agr. Machinery Tech.	5	ACF 464 Investments	5
AN 352 Tractor & Engine Tech.	5	EC 465 Public Finance	5
AN 353 Farm Bldg. Tech.	5	EC 474 Bus. and Econ. Stat. II	5
AN 354 Agr. Proces. Tech.	5		
AY 404 Fiber & Oil Crops	5	Group 3	
AY 406 Comm. Fert.	3	RSY 362 Community Org.	5
AY 407 Soil Management	5	RSY 461 Rural Social Org.	5
HF 308 Veg. Crops	5	RSY 462 Sociology of Community Dev.	5
HF Comm. Veg. Crops	3	IE 204 Computer Programming	3
Group 2		PA 210 Intr. to Philosophy	3
AS 302 Farm Records and Tax Mgt.	5	PA 214 Intr. to Ethics	3
AS 303 Agricultural Crop	3	PG 211 Psychology I	5
AS 304 Agr. Finance	3	PG 330 Social Psychology	4
AS 305 Farm Appraisal	3	PG 360 Fields of Prof. Psychology	5
AS 409 Land Economics	5	SY 203 Cultural Anthropology	5
		SY 408 Ind. Socio.	5
		ZY 204 Insects	3

Agricultural Engineering

This technical field trains engineers in the agricultural areas. The curriculum includes courses basic to all types of engineering, courses with particular emphasis on engineering problems in agriculture, and general agricultural courses. The curriculum leads to a degree of Bachelor of Science in Agricultural Engineering. Students completing the curriculum have opportunities in many types of work where both engineering and agricultural knowledge are required.

The Agricultural Engineering curriculum is accredited by the Engineers' Council for Professional Development.

Curriculum in Agricultural Engineering (AN)

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
MH 161 An. Geom. & Cal. 5	MH 162 An. Geom. & Cal. 5	MH 163 An. Geom. & Cal. 5
BI 101 Prin. of Biology 5	CH 103 Gen. Chem. 5	CH 104 Gen. Chem. 5
TS 106 Graphical Methods 2	& Lab. 5	& Lab. 5
EH 101 English Comp. 3	BI 102 Plant Biology 5	EH 102 English Comp. 3
LY 101 Use of Library 1	PE 102 Begin. Swim. 1	HY 101 World History 3
PE 101 Fd. of Phys. Ed. 1	†Basic ROTC 1	PE From Group II 1
†Basic ROTC 1		†Basic ROTC 1

SOPHOMORE YEAR

MH 264 An. Geom. & Cal. 5	PS 221 Gen. Physics II 4	MH 265 Diff. Equat. 3
PS 220 Gen. Physics I 4	ME 202 Engr. Mat. Science 3	ME 301 Thermodynamics I 4
BI 103 Animal Biology 5	ME 207 Strength of Mat. 3	IE 204 Comp. Prog. 3
ME 205 Appl. Mech. Stat. 4	EH 103 English Comp. 3	ME 321 Dynamics I 4
†Basic ROTC 1	HY 102 World History 3	PS 222 Gen. Physics II 4
	†Basic ROTC 1	†Basic ROTC 1

JUNIOR YEAR

EE 262 Elec. Circuits 3	AS 202 Agric. Econ. I 5	EE 381 Elec. Magn. Devices 4
PS 320 Mod. Physics 3	EE 273 Elec. Devices 3	MH 362 Engr. Math I 3
AN 301 Mech. of Farm Mach. 3	AN 302 Mech. of Trac. Power 3	AN 306 Elec. Systems 3
AN 303 Soil & Water Engr. I 4	HY 103 World History 3	AN 304 Drain. & Irrig. 3
AN 307 Structures Des. I 3	AN 305 Agric. Proc. Engr. 3	Agric. Engr. Elective 3
ME 340 Fluid Mech. 3		

First Quarter		SENIOR YEAR Second Quarter		Third Quarter	
SC 202 App. Sp. Comm.	3	PA 202 Ethics & Soc.	5	Engr. Electives	3
AY 307 Gen. Soils	5	Agric. Engr.		Social & Hum.	
Engr. Electives	11	Elective	3	Elective	7
		Engr. Electives	3	Agric. Electives	5
		Agric. Elective	5		

Total — 210 quarter hours

*Students who have not had a course in drawing will need to take TS 102 before taking TS 106.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

ELECTIVES

Engineering electives and Agricultural Engineering electives will be selected in consultation with the faculty adviser and will be subject to the approval of the Department Head. A minimum of six hours of Agricultural Engineering electives will be taken by each student. The elective selection is to be based on the student's area of interest or specialization.

Three hours of Advanced ROTC may be substituted for SC 202 Applied Speech Communication.

Requirements for agricultural electives may be met by taking 10 hours from the following: AY 455 Soil Physics, BY 401 Experimental Statistics for Biological Sciences, BY 306 Fundamentals of Plant Physiology, AS 401 Farm Management, ZY 402 Economic Entomology, AY 402 Soil Fertility, ADS 204 Animal Biochemistry and Nutrition.

APPROVED HUMANISTIC-SOCIAL ELECTIVES

History and Government

HY 322 The U.S. in World Affairs	3
HY 371 History of the West	3
HY 460 Great Leaders of History	5
PO 209 American Government	5

The Arts

AT 352 American Painting and Sculpture	3
AT 431 Contemporary Art	3
AR 360 Appreciation of Architecture	3
TH 313 Theatre Appreciation I	3
TH 314 Theatre Appreciation II	3
MU 375 Appreciation of Music	3
MU 374 Masterpiece of Music	3

Economics and Geography

EC 206 Socio-Economic Foundations of Contemporary America	3
GY 301 Geo-Political Basis of World Powers	5
GY 405 Cultural Geography of the World	5
GY 407 World Resources & Their Utilization	5

Sociology

SY 201 Introduction to Sociology	5
SY 204 Social Behavior	5
SY 311 Technology and Social Change	3

Philosophy and Religion

PA 210 Introduction to Philosophy	3
PA 330 Philosophy of Religion	5

Psychology

PG 211 General Psychology I	5
PG 461 Industrial Psychology	5

Literature

EH 320 An Introduction to Drama	3
EH 350 Shakespeare's Greatest Plays	3
EH 365 Southern Literature	3
EH 381 The Literature of the Age of Reason	3
SP 310 Great American Speeches	3

APPROVED ENGINEERING ELECTIVES

AN 401 Agricultural Power and Machinery Design	3
AN 403 Soil & Water Engineering II	3
AN 405 Elec. & Processing Systems Design	3
AN 407 Agricultural Structures Design II	3
AN 410 Design Problems	3
AN 411 Design Problems	3
ME 302 Thermodynamics II	3
ME 316 Strength of Materials II	4
ME 322 Dynamics II	4
ME 341 Fluid Mechanics II	4
ME 427 Mechanical Vibrations	4
ME 421 Heat Transfer	4
ME 428 Air Conditioning and Refrigeration	4
ME 432 Automatic Controls	3
ME 439 Mechanical Engr. Design I	4
ME 440 Mechanical Engr. Design II	3
ME 443 Photoelastic Stress and Strain An.	3
CE 304 Theory of Structures I	5
CE 305 Water Supply and Disposal Systems	5
CE 308 Hydraulics	5
CE 380 Theory of Structures II	5
CE 418 Soil Mechanics	5
CE 423 Similitude in Engineering	3
CE 408 Engineering Foundations	3
CE 411 Flow in Open Channels	5
CE 412 Hydrology	5
IE 311 Engineering Statistics I	3
IE 320 Engineering Economy	5

Biological Sciences (BI)

Major in Botany

The Botany curriculum is designed for those students interested in the fundamental plant science part of the Life Sciences. The required courses in this curriculum are established to give the student knowledge of the basic nature of plants as a phase of general culture and as a basis for further study in the plant sciences. Through proper selection of electives students may prepare for careers in research, teaching extension, or agribusiness activities.

The curriculum is administered through a faculty advisory system whereby a program of study may be developed in accordance with the interests and needs of each individual student. Thus, a student may specialize if desired in an area such as plant morphology, pathology, physiology, etc.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
BI 101 Prin. of Biology	5	BI 102 Plant Biology	5	BI 103 Animal Biology	5
MH 160 Pre-Cal. w. Trig.	5	MH 161 An. Geom. & Cal.	5	CH 103 Fund. Chem.	5
EH 101 English Comp.	3	EH 102 English Comp.	3	& Lab.	5
HY 101 World History	3	HY 102 World History	3	FH 103 English Comp.	3
†Basic ROTC	1	LY 101 Use of Library	1	HY 103 World History	3
		†Basic ROTC	1	†Basic ROTC	1

SOPHOMORE YEAR

CH 104 Fund. Chem.		CH 104 Org. Chem. Elective	5	BY 300 Gen. Microbiology I	5
& Lab.	5	BY 309 Gen. Plant	5	CH 104 Chemistry Elective	5
ZY 300 Genetics	5	Pathology	5	ZY 300 Zoology Elective	5
EC 200 Gen. Economics or		GL 101 Intr. Geology I	5	†Basic ROTC	1
AS 202 Agr. Economics I	5	†Basic ROTC	1	PE 101 From Group II	1
†Basic ROTC	1	PE 102 Begin. Swim.	1		
PE 101 Fd. of Phys. Ed.	1				

JUNIOR YEAR

PS 205 Intr. Physics	5	PS 206 Intr. Physics	5	BY 306 Fund. Plant	
SC 202 Appl. Sp. Comm.	3	AY 304 General Soils	5	Physiology	5
PA 210 Intr. Philosophy	3	EH 102 English Elective	3	ZY 304 Gen. Entomology	5
Elective	6	Elective	5	Electives	8

SENIOR YEAR

First Quarter		Second Quarter		Third Quarter	
BY 413 Gen. Plant Ecology	5	BY 415 Plant Anatomy	5	BY 406 Systematic Botany	5
FL 121 Elem. French or		FL 122 Elem. French or		Electives	13
FL 151 Elem. German	5	FL 152 Elem. German	5		
ZY 300 Zoology Elective	5	Electives	8		
Elective	5				

Total — 210 quarter hours

Students desiring to major in Botany will be assigned an adviser. A major will, during the sophomore year, with the assistance and approval of the adviser, develop a plan of study for the junior and senior years from lists of approved elective courses. As approved by the Dean of Agriculture and the student's adviser, substitutions may be permitted to meet specific needs of individual students.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Major in Microbiology

FRESHMAN YEAR

Fall Quarter		Winter Quarter		Spring Quarter	
BI 101 Prin. of Biol.	5	BI 102 Plant Biol.	5	BI 103 Animal Biology	5
MH 160 Pre-Cal. w. Trig.	5	MH 161 An. Geom. & Cal.	5	CH 103 Fund. Chem.	5
EH 101 English Comp.	3	EH 102 English Comp.	3	& Lab.	5
HY 101 World History	3	HY 102 World History	3	EH 103 English Comp.	3
†Basic ROTC	1	LY 101 Use of Library	1	HY 103 World History	3
		†Basic ROTC	1	†Basic ROTC	1

SOPHOMORE YEAR

CH 104 Fund. Chem.		AS 202 Agr. Econ. I or		BY 300 Gen. Microbiol. I	5
& Lab.	5	EC 200 Gen. Ec.	5	CH 208 Org. Chem.	5
PS 205 Intr. Physics	5	CH 207 Org. Chem. & Lab.	5	FL 121 Elem. Fr. or	
ZY 304 Gen. Ent.	5	PS 206 Intr. to Physics	5	FL 151 Elem. German	5
†Basic ROTC	1	†Basic ROTC	1	†Basic ROTC	1
PE 101 Fd. of Phys. Ed.	1	PE 102 Begin. Swim.	1	PE 101 From Group II	1

JUNIOR YEAR

BY 301 Gen. Micro. II	5	BY 303 Micro. Taxo.	5	ADS 414 Food Microbiol.	5
PA 210 Intr. Philosophy	3	SC 202 App. Oral. Sp.		BY 302 Med. Microbiol.	5
FL 122 Elem. Fr. or		Comm.	3	ZY 404 Med. Entomology	5
FL 152 Elem. German	5	EH 102 Eng. Elect.	5	Electives	3
ZY 300 Genetics	5	AY 304 Gen. Soils	5		

SENIOR YEAR

First Quarter		Second Quarter		Third Quarter	
BY 405	Intr. Mycology 5	BY 440	Microbiol. Physio. 5	BY 442	General Virology 5
BY 444	Microbiol. Methods 5	BY 460	Spec. Prob. 5	BY 443	Immunol. & Seral. 5
ADS 418	Biochemistry 5		in Microbiol. 3		Electives 7
	Elective 3	ADS 419	Biochemistry 5		
			Electives 5		

Total — 210 quarter hours

Students desiring to major in Microbiology will be assigned an adviser. A major will, during the sophomore year, with the assistance and approval of the adviser develop a plan of study for the junior and senior years from lists of approved elective courses. As approved by the Dean of Agriculture and the student's adviser, substitutions may be permitted to meet specific needs of individual students.

†Students not taking Basic ROTC must elect six appropriate hours as replacement.

RECOMMENDED ELECTIVE COURSES FOR UNDERGRADUATE MAJORS IN MICROBIOLOGY

Electives will be selected in consultation with faculty advisers based on student needs and interests. However, one elective course must be taken in each of two broad academic areas (humanities and social studies).

Sciences & Mathematics

AM 304	Meteorology	5
ADS 204	Animal Biochem. & Nutrition	5
AN 350	Soil & Water Tech.	5
AY 402	Soil Fertility	5
AY 410	Methods of Plant Breeding	5
BY 306	Fundamental Plant Phys.	5
BY 310	Forest Pathology	3
BY 401	Biological Statistics	5
BY 406	Systematic Botany	5
BY 409	Marine Botany	6
BY 410	Aquatic Plants	5
BY 411	Phycology	5
ZY 306	General Animal Ecology	5
ZY 310	Cell Biology	5
ZY 401	Invertebrate Zoology	5
ZY 411	General Parasitology	5
ZY 415	Limnology	5
ZY 416	Biol. Product & Water Quality	5
ZY 421	Vert. Zoo I	5
ZY 422	Vert. Zoo II	5
ZY 424	Animal Physiology	5
ZY 435	Marine Biology	5

Humanities

EH 254, 255	Survey of Eng. Lit.	3, 3
EH 301	Creative Writing	3
EH 310	Word Study	3
EH 394	Intr. to Linguistics	5
EH 495	Southern Literature	5

BY 412	Advanced Plant Pathology I	5
BY 413	Gen. Plant Ecology	5
BY 414	Plant Morphology	5
BY 415	Plant Anatomy	5
BY 416	Biol. Micro., Microtech. & Photo	5
BY 419	Prin. Plant Disease Control	3
BY 430	Plant Nematology	5
CH 204	Analytical Chemistry	3
CH 204L	Analytical Chemistry Lab.	2
CH 420	Biochemistry	5
GL 312	Paleobotany	5
MH 162, 163	Analytic Geometry & Calc.	5, 5
MH 264	Analytic Geometry & Calculus	5
MH 265	Linear Differential Equations	3
PA 211	Intr. to Deductive Logic	3
PA 212	Intr. Sci. Reasoning	3
PA 214	Intr. Ethics	3

Social Studies

EC 206	Socio-Ec. Found. Contemp. Amer.	3
GY 203	Economic Geography	5
GY 301	Geo-Politic. Basis World Pow.	3
GY 405	Cultural Geography of World	5
HY 201	History of U.S. to 1865	5
HY 202	History of U.S. Since 1865	5
HY 322	The U.S. in World Affairs	3
HY 381	History of Alabama	5
HY 406	Rec. U.S. History, 1877-1914	5
HY 407	Rec. U.S. History, 1914-1932	5
PG 211, 212	Psychology I & II	3, 3
RSY 261	Rural Sociology	5

Majors in Zoological Sciences

Majors in zoological sciences are for students interested in careers in animal biology. One has the choice of five options: zoology, entomology, fisheries, marine biology, or wildlife, and degrees are offered in each option.

During the first two years, all students take the same subjects which emphasize the basic sciences and background courses. Thereafter, it is possible to elect courses to fit specific needs of the student in his or her option. The program during the junior and senior years is developed under the guidance of a faculty adviser who works closely with the student. During this period the student may wish to work toward graduate school upon graduation. The faculty adviser assists the student in developing a program of study and with other academic and personal matters throughout his four years of training. Diversified career opportunities are excellent for well-trained persons in zoological sciences, and the opportunities increase as the level of training is raised.

At the bachelor's degree level, greatest demands are for research, management, survey, and regulatory work with state or federal agencies concerned with

insects, fish, wildlife, or public health; for public relations and sales work with commercial companies; for technical assistants in research laboratories; for conservation and recreational work; and for private enterprises. At the graduate degree levels, opportunities are greatly enhanced, particularly for teaching, research, and extension at the university level; for research, development, and management with industry; for research with the Public Health Service, Fish and Wildlife Service, Entomology Research Division, United States Department of Agriculture, the Atomic Energy Commission, and other research organizations; and for employment in other areas.

Zoological Sciences

Options: Entomology, Fisheries, Marine Biology, Wildlife, Zoology

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
ZY 100 Zoological Orient. — 0	BI 102 Plant Biology — 5	BI 103 Animal Biology — 5
BI 101 Prin. of Biology — 5	CH 104 Fund. Chem. — 5	MH 162 An. Geom. & Cal. — 5
CH 103 Fund. Chem. — 5	& Lab. — 5	PS 205 Intr. Physics — 5
& Lab. — 5	MH 161 An. Geom. & Cal. — 5	PE From Group II — 1
MH 160 Pre-Cal. W. Trig. — 5	PE 102 Begin. Swim. — 1	‡Basic ROTC — 1
PE 101 Fd. of Phys. Ed. — 1	‡Basic ROTC — 1	
‡Basic ROTC — 1		
SOPHOMORE YEAR		
ZY 300 Genetics — 5	ZY 303 Syst. & Evolution — 5	ZY 306 Animal Ecology — 5
EH 101 English Comp. — 3	CH 207 Organic Chem. — 5	EH 103 English Comp. — 5
HY 101 World History — 3	& Lab. — 5	HY 103 World History — 3
PS 206 Intr. Physics — 5	EH 102 English Comp. — 5	CH 208 Organic Chem. — 5
‡Basic ROTC — 1	HY 102 World History — 3	& Lab. — 5
	‡Basic ROTC — 1	‡Basic ROTC — 1

JUNIOR YEAR

54 hours to be arranged in consultation with adviser.

SENIOR YEAR

54 hours to be arranged in consultation with adviser.

Total hours required — 210 quarter hours

‡Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

ADDITIONAL COURSES TO BE TAKEN BY ALL MAJORS

AS 202 Ag. Economics I — 5	ZY 310 Cell Biology — 5
BY 300 General Microbiology I — 5	ZY 411 Parasitology** — 5
SC 202 App. Sp. Comm. — 3	ZY 421 or 422 Vert. Zoology** — 5
ZY 301 Comp. Anatomy — 5	ZY 424 Animal Physiology — 5
ZY 304 Gen. Entomology — 5	ZY 401 Invert. Zoology*** — 5

*Except Fisheries

**Fisheries students will take BY 306 and FAA 438 in lieu of these courses

***Except Wildlife

In addition to the above requirements, all students in Marine Biology must spend at least one summer at the Gulf Coast Research Laboratory and take 15 to 18 hours of course work there.

The remaining requirements will include a minimum of 17 hours selected from the humanities and social science electives and 35 hours of group electives including at least 10 hours of botanical sciences from the following lists.

GROUP ELECTIVES—ZOOLOGY, FISHERIES, ENTOMOLOGY, MARINE BIOLOGY AND WILDLIFE

ADS 419, 419, Biochemistry — 5, 5	BY 414 Plant Morphology — 5
AY 304 Soils — 5	BY 415 Developmental Plant Anatomy — 5
BY 301 General Microbiology — 5	CH 105 General Chemistry — 3
BY 302 Medical Microbiology — 5	CH 105L General Chemistry Lab. — 2
BY 303 Microbial Taxonomy — 5	CH 204-204L Analytical Chemistry — 5
BY 306 Plant Physiology — 5	CH 316 Physical Chemistry — 5
BY 309 Plant Pathology — 5	CH 420 Biochemistry — 5
BY 401 Biological Statistics — 5	EH 304 Technical Writing — 3
BY 406 Systematic Botany — 5	GL 101, 102, 103 Introductory and
BY 409 Marine Botany — 6	Historical Geology — 5, 5, 5
BY 411 Phycology — 5	MH 163 Geometry and Calculus — 5
BY 413 Plant Ecology — 5	MH 264 Analytic Geometry-Calculus — 5

MH 265 Linear Differential Equations	3	ZY 410 Systematic Entomology	5
PS 419 Scientific Instrumentation	3	ZY 415 Limnology	5
ZY 207 Birds	3	ZY 418, 419 Experimental Heredity	3, 3
ZY 302 Vertebrate Embryology	5	ZY 420 Human Heredity	5
ZY 308 Micrology	5	ZY 426 Principles of Game Mgt.	5
ZY 326 Wildlife Biology	5	ZY 438 General Ichthyology	5
ZY 402 Economic Entomology	5	ZY 443 Marine Vertebrate Zoology and Ichthyology	9
ZY 404 Medical Entomology	5	ZY 444 Marine Fisheries Biology	6
ZY 405 Forest Insects	5	ZY 445 Marine Invert. Zoology I	9
ZY 406 Bee Culture	3	ZY 446 Marine Invert. Zoology II	9
ZY 407 General Insect Morphology	5	ZY 450 Zoogeography of the Vertebrates	5
ZY 409 Histology	5		

ADDITIONAL GROUP ELECTIVES—FISHERIES AND WILDLIFE

AY 401 Prin. of Forage Prod.	5	FAA 446 Fish Diseases	3
BY 410 Aquatic Plants	5	FAA 447 Mgt. of Streams & Large Impoundments	3
FAA 416 Biological Productivity & Water Quality	3	FY 303 Forest Recreation	3
FAA 428 Hatchery Management	5	FY 415 Range Management	2
FAA 436 Mgt. of Sm. Impoundments	3	FY 420 Silviculture	5
FAA 437 Fisheries Biology	3	ZY 435 Marine Biology	3
FAA 445 Fish Parasitology	3	ZY 439 Aquatic Communities	5

ADDITIONAL GROUP ELECTIVES—MARINE BIOLOGY

BY 410 Aquatic Plants	5	ZY 435 Marine Biology	3
FAA 416 Biological Productivity	3	ZY 440 Physical Marine Geology	4½
FAA 437 Fisheries Biology	3	ZY 441 Chemical Marine Geology	4½

HUMANITIES AND SOCIAL SCIENCES ELECTIVES FOR ZOOLOGICAL SCIENCES

RSY 361 Rural Sociology	5	HY 381 History of Alabama	5
RSY 362 Community Organization	5	JM 315 Agr. Journalism	3
RSY 462 Sociology of Com. Develop.	5	JM 322 Feature Writing	5
AS 405 Agricultural policy	3	JM 421 Photo Journalism	5
AS 409 Land Economics	5	PA 202 Ethics and Society	5
EH 141 Medical Vocabulary	3	PA 210 Introduction to Philosophy	3
EH 253, 254, 255 Survey of English Literature	3, 3, 3	PA 211 Introduction to Deductive Logic	3
EH 390 Advanced Composition	3	PA 212 Intr. to Inductive Logic	3
EH 357, 358 American Literature	5, 5	PA 400 Philosophy of Science	5
FL 121, 122, 221, 222 Elementary & Intermediate French	5, 5, 5, 5	PG 211 Psychology I	5
FL 131, 132, 231, 232 Elementary & Intermediate Spanish	5, 5, 5, 5	PG 445 Animal Behavior	4
FL 151, 152, 251, 252 Elementary & Intermediate German	5, 5, 5, 5	PO 209 American Government	5
GY 102 Principles of Geography	5	PO 210 State & Local Government	5
GY 203 Economic Geography	5	PO 312 Introduction to Comparative Government	5
HY 322 The U.S. in World Affairs	3	SY 201 Introduction to Sociology	5
		SY 203 Cultural Anthropology	5

Biological Sciences and Teacher Education

Students in the Biological Sciences curriculum with majors either in botanical or zoological sciences who wish also to prepare for certification as teachers in secondary schools may pursue the dual objective of completing the requirements for the B.S. degree in their particular Biological Sciences major and the requirements of the Teacher Education Program.

Students who choose the dual objective program should declare this intent to their departmental advisers by the end of their sophomore year if possible. Students pursuing the dual objective plan will be assigned an adviser in the School of Education who will advise them on all matters involving requirements for completing the Teacher Education Program.

In addition to the specific requirements, including group electives required for the B.S. in Zoological Sciences or Botany, these students must also include the following courses in their curriculum:

EH Literature (253, 254, 255 or 260, 261, 262)	9
SY 201 Introduction to Sociology	5
Freshman or Transfer Orientation	1
Introduction to Laboratory Experiences	1

FED 213 Human Growth and Development	5
FED 214 Psychological Foundations of Education	5
FED 320 Social Foundations of Education	5
FED 480 Philosophical Foundations of Education	5
SED 405K Teaching in Secondary School-Science	3
SED 410K Program in Secondary School-Science	3
SED 425K Professional Internship	15

None of the above courses may be used as group electives toward the degree in zoological sciences or botany, but literature, sociology, FED 213, or FED 214 may be used as needed as humanistic-social electives. Students should also elect 10 additional hours of chemistry to satisfy the requirements for a chemistry minor. Students in the Zoological Sciences curriculum must elect at least 5 additional hours of botanical sciences.

Food Science

The Food Science curriculum is designed for those who are interested in positions in the rapidly expanding food industry. The curriculum is administered by an interdepartmental advisory committee, with K. M. Autrey, 242 Animal Sciences Building, as chairman. A faculty adviser will assist in the development of a program of study to meet the needs and interests of the individual student. In this manner, a student may take a general course or may specialize in a commodity area such as dairy products, meats or fruits and vegetables. He may elect a business option with supporting courses in economics, agricultural economics, and business or he may elect a sciences option.

Curriculum in Food Science (FS)

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
ADS 101 Man's Food _____ 3	CH 104 Fund. of Chem. & Lab. _____ 5	BI 101 Prin. of Biology _____ 5
CH 103 Fund. of Chem. & Lab. _____ 5	EH 102 English Comp. _____ 3	EH 103 English Comp. _____ 5
EH 101 English Comp. _____ 3	HY 101 World History _____ 3	HY 102 World History _____ 3
MH 160 Pre-Cal. w. Trig. _____ 5	MH 161 An. Geom. & Cal. _____ 5	CH 207 Organic Chem. & Lab. _____ 5
†Basic ROTC _____ 1	LY 101 Use of Library _____ 1	†Basic ROTC _____ 1

SOPHOMORE YEAR

HY 103 World History _____ 3	ADS 204 Animal Biochem. or _____ 5	HF 345 Food Chem. _____ 3
AS 202 Agri. Economics I or _____ 5	NF 318 Nutr. Biochem. _____ 5	BI 103 Animal Biology _____ 5
EC 200 Gen. Economics _____ 5	BI 102 Plant Biology _____ 5	BY 300 Gen. Microbiology I _____ 5
PG 211 Psychology I _____ 3	EH 345 Bus. & Prof. Writing _____ 5	SC 202 Appl. Sp. Comm. _____ 3
PS 204 Ed. of Physics or _____ 5	PE 102 Begin. Swim. _____ 1	PE PE from Group II _____ 1
PS 205 Intr. Physics _____ 5	†Basic ROTC _____ 1	†Basic ROTC _____ 1
PE 101 Ed. of Phys Ed. _____ 1		
†Basic ROTC _____ 1		

JUNIOR YEAR

HF 340 Indust. Food Pres. Tech. _____ 5	NF 372 Fund. of Nutrition _____ 3	ADS 414 Food Microbiology _____ 5
Electives** _____ 13	Electives** _____ 15	Electives** _____ 12

SENIOR YEAR

HF 343 Food Analysis & Qual. Control _____ 5	ADS 415 Food Plant Sanitation _____ 3	ADS 420 Undergrad. Seminar _____ 1
Electives** _____ 12	Electives _____ 15	Electives** _____ 16

Total — 210 quarter hours

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

**A minimum of 20 hours must be completed from among the approved Food Technology electives. Students in the Business option will complete a minimum of 45 hours from the approved Business electives and those in the Science option will complete a minimum of 40 hours from the approved Science electives.

SUGGESTED ELECTIVES FOR FOOD SCIENCE

Food Technology

ADS 309 Live Animal & Carcass Eval.	5
ADS 310 Meat & Meat Prod.	5
ADS 410 Meat Technology	5
ADS 412 Dairy Plant Processing	5
ADS 413 Dairy Plant Processing	5
HF 341 Ind. Food Equip. and Processing I	5
HF 342 Ind. Food Equip. and Processing II	5
HF 402 Storage, Packaging & Marketing of Vegetable Crops	5
HF 440 Food Engineering	5
PH 411 Poultry Marketing	5
NF 416 Quantity Food Production	5
NF 464 Experimental Foods	5
NF 488 International Nutrition	5
HF 344 Tech. of Jellies and Snack Foods	5

Business

ACF 211-212 Principles of Acctg.	5, 5
EC 202 Economics II	5
EC 274 Bus. & Econ. Statistics I	5
EC 360 Money and Banking	5
ACF 361 Principles of Bus. Finance	5
MT 311 Prin. of Marketing	5

MN 310 Prin. of Management	5
MN 341 Bus. Law I	5
MN 480 Bus. Pol. & Adm.	5
IE 201 Industrial Admin. Info.	5
IE 301 Retrieval & Comp. Program	5
IE 302 Prod. Control Techniques	5
AS 301 Agricultural Marketing	5
IE 320 Engineering Economy	5

Science

BY 401 Biological Statistics	5
CH 208 Organic Chem.	5
CH 105-105L Fund. of Chem.	5
CH 204-204L Anal. Chemistry	5
PS 206 Intro. Physics	5
CH 316 Physical Chemistry	5
ADS 418-419 Biochemistry	5, 5
MH 162-163-264 Anal. Geo. & Calc.	5, 5, 5
BY 301 Gen. Microbiology II	5
BY 302 Medical Microbiology	5
BY 303 Microbial Taxonomy	5
BY 440 Microbial Physiology	5
BY 441 Sanitary Microbiology	5

Forestry

Two curricula are offered in forestry, one in forest management and the other in wood technology. The former leads to the degree Bachelor of Science in Forestry while the other leads to the degree Bachelor of Science in Wood Technology. The Department also offers an honors program which leads to the degree Bachelor of Science in Forestry (Honors Program) and a recreation option in the forest management curriculum.

Training in forest management and administration prepares the student as a land manager. He acquires professional knowledge and skills relating to efficient production of wood as a raw material. He studies policies, techniques and procedures whereby land may be managed for related products and services including water, wildlife and recreation. There is a strong demand for foresters in private industry in the South. State and Federal agencies as well as consulting foresters employ a large number of graduates. The graduate may expect his initial assignments to include land line surveying, timber cruising, timber marking, and land and timber purchasing. After experience is gained the graduate will assume more responsibility for land management plans and policies in his capacity as a land manager.

The recreation option for the forest management curriculum is designed to prepare foresters to cope with the special problems arising from the increased use of forest land for recreational purposes. Some attention is given to the sociological and psychological aspects of these activities and the harmonious inclusion of recreation into the overall land management program.

Wood technology is the science of making the most efficient use of the products of the tree. This includes the development of new products as well as more efficient production of standard products. The wood technologist must understand the physics and chemistry of wood as well as its anatomy and structure and must be familiar with various wood products and the methods for manufacturing them. The curriculum is sufficiently flexible that the student may specialize in chemistry, structural design, industrial management or in other fields of his choice by proper selection of his minors in these fields. The wood technologist finds employment with wood manufacturing industries

SENIOR YEAR

First Quarter

FY 415 Range Mgt.	2
FY 420 Silviculture	5
FY 437 For. Econ. I	3
FAA 447 Mgt. of Streams & Lg. Impoundments	3
Electives	3

Second Quarter

FY 302 For. Fire Cont.	3
FY 436 For. Watershed Mgt.	3
FY 438 For. Econ. II	3
ZY 425 For. Wildlife Mgt.	3
Electives	6

Third Quarter

FY 407 For. Management	5
FY 434 For. Pol. & Law	3
FY 469 Rec. Site Mgt.	3
Elective	5

Total — 225 quarter hours

Honors Program in Forestry

The Honors Program in Forestry provides able students opportunity to explore in depth areas in which they are interested, to prepare for graduate school, or to obtain a more rounded education. The program is flexible, permitting concentration of effort in areas of the student's choosing.

Students with at least five quarters remaining in the Forest Management curriculum and with a grade point average of 1.75 or better may apply for admission to the program following completion of the course work requirements through the first six quarters. Permission for election to the program rests with the Head and the Executive Council of the Department of Forestry. Upon admission the student will be assigned to a faculty adviser who will guide him in the preparation of his program.

JUNIOR YEAR

First Quarter

GL 102 Intro. Geology II	5
Electives	13

Second Quarter

AY 305 General Soils	5
FY 203 Silvics I	5
FY 309 Sampling	5
Electives	3

Third Quarter

FY 207 Silvics II	5
FY 421 For. Research	3
Meth.*	3
Electives	10

SENIOR YEAR

FY 420 Silviculture	5
FY 437 For. Econ. I	3
Electives	10

FY 438 For. Econ. II	3
Electives	15

FY 407 For. Management	5
FY 480 Senior Thesis	5
FY 490 Seminar in For.	1
Electives	6

Total — 210 quarter hours

*Any three or five hour course in statistics may be substituted for FY 421.

Twenty-five of the free elective hours are to be chosen under the supervision of the faculty adviser, so as to develop a distinct program leading to a predetermined goal.

Curriculum in Wood Technology (WT)

FRESHMAN YEAR

First Quarter

EH 101 English Comp.	3
HY 101 World History	3
CH 103 Fund. Chem. & Lab.	5
MH 160 Pre-Cal. W. Trig.	5
FY 105 For. Convocation*	0
†Basic ROTC	1
PE 101 Fd. of Phys. Ed.	1

Second Quarter

EH 102 English Comp.	3
HY 102 World History	3
CH 104 Fund. of Chem. & Lab.	5
MH 161 An. Geom. & Cal.	5
†Basic ROTC	0
PE 102 Begin. Swim.	1

Third Quarter

EH 103 English Comp.	3
HY 103 World History	3
CH 105 Gen. Chem. & Lab.	5
MH 162 An. Geom. Cal.	5
†Basic ROTC	1
PE From Group II	1

SOPHOMORE YEAR

BI 101 Prin. of Biology	5
PS 205 Intr. Physics	5
MH 163 Anal. Geom. & Cal.	5
†Basic ROTC	1

BI 102 Plant Biology	5
PS 206 Intr. Physics	5
ADS 204 An. Biochem. & Nut.	5
†Basic ROTC	1

BI 103 Animal Biology	5
FY 206 Wood Measure**	3
TS 102 Eng. Drawing	2
FY 205 Wood Ident. & Uses	3
EH 304 Technical Writing	3
†Basic ROTC	1

JUNIOR YEAR

First Quarter	Second Quarter	Third Quarter
EC 200 Gen. Economics _____ 5	FY 432 Seasoning & _____ 5	PG 211 Psychology I _____ 5
FY 201 Dendrology _____ 5	Preserv.** _____ 5	FY 433 Seas. & Preserv. Lab. _____ 2
FY 311 Wood Anatomy** _____ 5	FY 421 For. Research _____ 3	Elective _____ 12
SC 202 App. Sp. Comm. _____ 3	Meth.*** _____ 3	
	Elective _____ 10	

SENIOR YEAR

FY 330 For. Products** _____ 5	FY 425 Wood Glu. & _____ 5	FY 431 Mech. Prop. of _____ 5
Elective _____ 13	Lam.** _____ 5	Wood** _____ 5
	Elective _____ 13	Elective _____ 13

Total — 210 quarter hours

Sufficient latitude is allowed that the student may plan his elective work with his adviser to fulfill his personal objectives while in college. One minor, consisting of 30 hours in the area of Mathematics, Chemistry or Engineering, is required. In addition, 10 hours in computer programming and 10 hours in statistics, including laboratory are to be selected from the electives. From the remaining elective hours, 10 are to be selected with the adviser in the general area of humanities. A student may always substitute a more intensive group of courses for one or more of the required courses, providing the same breadth of coverage is maintained.

As a part of the requirement for the degree with a major in wood technology the student must complete a minimum of three weeks of supervised tours of forest products industries. A satisfactory report on these tours is to be submitted to the department head by the beginning of the final quarter prior to graduation.

*This course to be taken in all except summer quarters.

**Alternate year offering.

***Any three or five hour course in statistics may be substituted for FY 421.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Landscape And Ornamental Horticulture

A blending of art, science and technology, Landscape and Ornamental Horticulture is a Life Science concerned with plants for personal enrichment and well-being. The professional Ornamentalist combines many diverse talents to suit his interests and ambitions.

The Landscape and Ornamental Horticulture curriculum provides professional and basic knowledge and develops basic skills in four areas — Landscape Design, Florist Crop Production, Nursery Crop Production and Retail Flower Shop Management. By proper selection of electives, students may prepare for careers in research, teaching or extension activities; as owners and managers of floral or woody ornamental production units and of retail outlets for floral and woody ornamental products; landscape designing; and managing recreational gardens and other areas.

Degree candidates are encouraged to have three months, or an equivalent of three months, practical experience in industry to be arranged by the student's major professor prior to graduation.

Curriculum in Landscape and Ornamental Horticulture (OH)

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
BI 101 Prin. Biology _____ 5	BI 102 Plant Biology _____ 5	CH 104 Fund. Chem. _____ 5
EH 101 English Comp. _____ 3	CH 103 Fund. Chem. _____ 5	& Lab. _____ 5
HF 101 Intr. Hort. _____ 1	& Lab. _____ 5	EH 103 English Comp. _____ 3
MH 160 Pre-Cal. w. Trig. _____ 5	EH 102 English Comp. _____ 3	HY 102 World History _____ 3
†Basic ROTC _____ 1	HY 101 World History _____ 3	MH 161 An. Geom. & Cal. _____ 5
PE 101 Fd. of Phys. Ed. _____ 1	†Basic ROTC _____ 1	†Basic ROTC _____ 1
	PE 102 Begin. Swim. _____ 1	PE _____ 1
		From Group II _____ 1

SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
BI 103 Animal Biology	5	HF 224 Plant Prop.	5	AS 202 Agr. Economics I	5
HF 221 Landscape Gard.	5	PA 210 Intr. Philosophy	3	CH 207 Organic Chem.	
HY 103 World History	3	PG 211 Psychology I	5	& Lab.	5
SC 202 App. Sp. Comm.	3	†Basic ROTC	1	†Basic ROTC	1
†Basic ROTC	1	Electives*	1	Electives	5

JUNIOR YEAR

BY 306 Plant Phys.	5	AY 304 Gen. Soils	5	EH 390 Adv. Comp.	5
HF 323 Chsc. Environ.		BY 309 Plant Pathology	5	Electives	13
Control	5	Electives	8		
Electives	8				

SENIOR YEAR

ZY 402 Econ. Ent.	5	Electives	18	AY 402 Soil Fertility	5
Electives	13			BY 406 System, Botany	5
				Electives	8

Total — 210 quarter hours

*Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*This curriculum consists of four areas of study: Retail Flower Shop Management, Florist Crop Production, Nursery Crop Production and Landscape Design. Electives are provided in the Sophomore, Junior and Senior year to prepare a student in one of these areas and are to be selected at the consent of the student's adviser and the approval of the Dean of Agriculture.

RECOMMENDED ELECTIVES IN LANDSCAPE AND ORNAMENTAL HORTICULTURE

Electives from the

Humanities and Social Sciences:

EH 253 Survey of English Literature	3
EH 285 Literature of the Western World	3
EH 301-302 Creative Writing	3-3
EH 365-366 Survey of American Literature	5-5
EH 377 The European Novel	5
EH 431-432 Shakespeare	5-5
FL 121 Elementary French	5
FL 122 Elementary French	5
FL 131 Elementary Spanish	5
FL 132 Elementary Spanish	5
FL 151 Elementary German	5
FL 152 Elementary German	5
FL 171 Elementary Russian	5
GY 201 Weather and Climate	5
GY 404 Physical Geography of the World	5
HY 201 History of U. S.	5
HY 202 History of U. S.	5
MU 371 Intr. to Music	3
PA 202 Ethics and Society	5
PA 210 Intr. to Philosophy	3
PA 211 Intr. to Deductive Logic	3
PA 212 Intr. to Inductive Logic	3
PA 310 Eastern Religious Thought	3
PA 315 Western Religious Thought	3
PA 401 The Philosophy of Communism	5
PO 209 Intr. Am. Govt.	5
RSY 261 Rural Sociology or	5
SY 201 Intr. to Sociology	5
RSY 362 Community Organization	5
SY 203 Cultural Anthropology	5

Group Electives:

ADS 418 Biochemistry	5
AN 350 Soil and Water Technology	5
AR 110 Design Fundamentals	5
AR 111 Design Fundamentals	5
AR 360 Appreciation of Architecture	3
AR 370 Spaces for Living	3
AS 301 Agricultural Marketing	5
AS 410 Agricultural Business Management	3
AT 105 Drawing I	5
AT 106 Drawing II	5
AT 113 Perspective	3
AY 405 Turf and Its Management	3
AY 406 Commercial Fertilizers	3
BY 300 Gen. Microbiology I	5
BY 401 Biological Statistics	5
BY 406 Systematic Botany	5
BY 413 General Plant Ecology	5
CE 201 Surveying I	5
CH 204 Analytical Chemistry	5
CH 208 Organic Chemistry	5
ACF 211-12 Intr. Accounting	5-5
MN 341 Business Law	5
MT 333 Salesmanship	3
EH 345 Bus. and Professional Writing	5
GL 101-2 Intr. Geology	5-5
HF 201 Orchard Management	5
HF 225 Flower Arranging	3
HF 308 Vegetable Crops	5
HF 325 Landscape Planning of Home Grounds	5
HF 326 Landscape Planning of Public Grounds	5
HF 421 Care & Maintenance of Orn. Plants	5
HF 422 Fund. of Floricultural Crop. Prod.	5
HF 423 Fund. of Nursery Management	5
HF 424 Planting Design	5
HF 425 Flower Shop Management	5
HF 427-8 Minor Problems	5-5
HF 429 Adv. Plant Propagation	5
HF 430 Marketing Hort. Spec. Products	5
HF 431 Adv. Landscape Gardening	5
HF 432 Controlled Plant Growth	5
JM 315 Ag. Journalism	3
MH 162-3 Analytic Geometry & Calculus	5-5
PS 205 Intr. Physics	5
PS 206 Intr. Physics	5
ZY 300 Genetics	5

School of Architecture and Fine Arts

E. KEITH MCPHEETERS, *Dean*

THE SCHOOL OF ARCHITECTURE AND FINE ARTS includes the Departments of Architecture, Art, Building Technology, Music and Theatre.

The Departments of Architecture and Building Technology offer undergraduate degree curricula in Architecture, Interior Design, Industrial Design, and Building Construction. The Department of Architecture also offers a graduate degree in Industrial Design. The Department of Architecture participates in the multidisciplinary graduate program in Urban and Regional Planning which is administered by the Graduate School and the Center for Urban and Regional Planning. The primary objective of these programs is to educate professional practitioners for many aspects of the designed physical environment.

The Departments of Art, Music and Theatre offer curricula in Fine Arts, Visual Design, Music and Theatre. The Art Department also offers a graduate degree in Fine Arts; and the Music Department offers a graduate degree in Music. The Departments of Art, Music, and Theatre cooperate with the School of Education in the education of teaching professionals. The objective of these programs is to develop creative and professionally knowledgeable practitioners and teachers in the arts and to provide a foundation for continuing professional development.

Department Of Architecture

The Department of Architecture was established in 1907 and is the oldest in the South. Courses are offered leading to the degrees Bachelor of Architecture, Bachelor of Interior Design and Bachelor of Industrial Design.

Admission

Acceptance for admission to professional curricula in architecture, and interior design in the School of Architecture will be determined by the Admissions Committee in the Department of Architecture on the basis of an evaluation of the candidate's test scores and academic records. The Committee will also consider any examples of professional or art work which the candidate may wish to submit.

Transfer

Transfer students from non-architectural programs will be required to begin the Design sequence at a level not higher than first quarter, second year. Transfer students from accredited schools of Architecture will be required to present examples of their work for evaluation by the Admissions Committee. The Committee will determine the level at which the student will enter the Design Sequence.

New students may enter the department any quarter. Transfer students with advanced credit may complete their first year requirements by taking advantage of the Summer session which combines AT 105 and AR 110 and 111.

Architecture

The Curriculum in Architecture prepares the student to take his place as a citizen and as a professional. Since the building industry is one of the three largest in the nation in terms of expenditure and employment, the architect today must accept a concern for the improvement of the physical environment and assume the leadership in evolving effective procedures toward this end. Therefore, in an area of broad technological advancement, the architect must bring to his work technical knowledge, social insight, creative imagination, and individual integrity.

The Department of Architecture is a member of the Association of Collegiate Schools of Architecture, and the curriculum in Architecture is accredited by the National Architectural Accrediting Board. Training at Auburn University prepares the student for the office experience and the examination required by the registration laws for the practice of architecture in Alabama as well as for examination by the National Council of Architectural Registration Boards.

Student work submitted to satisfy course requirements may be retained by the Department for indefinite periods to be used for exhibition or for record purposes. Simulated State Board examinations will be given during the fifth year to prepare Architecture students for their registration examination after graduation.

The Cooperative Education Program is also offered. For more information, refer to page 47.

Curriculum in Architecture (AR)

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
AR 110	Design Fundamentals _____ 5	AR 111	Design Fundamentals _____ 5	AT 105	Basic Drawing _____ 5
EH 101	English Comp. _____ 3	EH 102	English Comp. _____ 3	EH 103	English Comp. _____ 3
MH 161	An. Geom. & Cal. _____ 5	MH 162	An. Geom. & Cal. _____ 5	HY 103	World History _____ 3
HY 101	World History _____ 3	HY 102	World History _____ 3	TH 103	Intr. to Arts _____ 1
TH 101	Intr. to Arts _____ 1	TH 102	Intr. to Arts _____ 1		Elective _____ 5
PE	Physical Education _____ 1	PE	Physical Education _____ 1	PE	Physical Education _____ 1

SECOND YEAR

AR 201	Architectural Design _____ 5	AR 202	Architectural Design _____ 5	AR 203	Architectural Design _____ 5
AR 361	Hist. & Theory of Architecture _____ 3	AR 362	Hist. & Theory of Architecture _____ 3	AR 363	Hist. & Theory of Architecture _____ 3
PS 205	Physics _____ 5	PS 206	Physics _____ 5	BT 206	Matls. & Constr. _____ 5
SY 201	Sociology _____ 5	BT 220	Intr. to Struc. _____ 3	BT 221	Mech. of Struc. _____ 5

THIRD YEAR

AR 301	Architectural Design _____ 5	AR 302	Architectural Design _____ 5	AR 303	Architectural Design _____ 5
AR 364	Hist. & Theory of Arch. _____ 3	BT 312	Structures II _____ 3	BT 313	Structures III _____ 3
BT 311	Structures I _____ 3		Elective _____ 5	EC 206	Socio-Economic Foundations _____ 3
PG 211	Psychology _____ 3		Elective _____ 5		Elective _____ 2
	Elective _____ 3				Elective _____ 5

FOURTH YEAR

AR 401	Architectural Design _____ 5	AR 402	Architectural Design _____ 5	AR 403	Architectural Design _____ 5
BT 411	Structures IV _____ 3	BT 413	Structures VI _____ 5		Seminar _____ 3
BT 412	Structures V _____ 3	BT 452	Bldg. Equipment _____ 3	BT 453	Bldg. Equipment _____ 3
SY 405	Sociology _____ 5	AR 481	Computers in Arch. _____ 3		Planning Elective _____ 3
AR 474	Intr. to Urban Planning _____ 3				Elective _____ 3

FIFTH YEAR		
First Quarter	Second Quarter	Third Quarter
AR 465 Architectural Design _____ 5	AR 466 Architectural Design _____ 5	AR 467 Architectural Design _____ 7
AR 471 Professional Prac. _____ 3	AR 472 Professional Prac. _____ 3	Seminar _____ 5
Group Elective _____ 5	AR 499 Design Research _____ 2	Elective _____ 3
Elective _____ 5	Group Elective _____ 5	Elective _____ 3
	Elective _____ 3	

Total — 265 quarter hours

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for twelve hours of general electives.

Two planning Electives must be selected from the following list:

- URP 405 (3) Metropolitan Area Governmental Problems
- URP 605 (3) Urban Design
- URP 607 (3) Regional and Urban Economics
- URP 615 (3) Seminar on Current Planning Issues
- URP 662 (3) Social System and Communities

Seminars will be chosen from the following list:

- AR 435 Art and Architecture Seminar _____ 3
- AR 460 The Architect and Society _____ 3
- AR 476 Seminar in Contemporary Concepts _____ 5
- AR 477 Seminar in Historical Problems _____ 5
- AR 478 Seminar in Tech. Problems _____ 3
- AR 479 Seminar in Architecture Literature _____ 2

Five-hour elective courses will include either three courses in advanced structures or electives chosen from the group electives in Art, Economics, English, Foreign Languages, History, Philosophy, Psychology, Sociology, and Speech Communications.

Special Problems in Architecture

Beginning in the third year of the curriculum in Architecture, students capable of independent study may, on recommendation of the faculty and with approval of the head of the department, pursue an area of special interest. This may be a group or team effort under the direction of the faculty. Each student or team shall submit a plan of study for approval before commencing the work. The student may earn a maximum of 15 hours of credit in independent study, a special project, or in research. After approval, students shall enroll in AR 495, Special Problems, for up to 5 hours in any one quarter. Evaluation of the work will be by faculty jury.

Interior Design

The curriculum in Interior Design seeks to prepare the student to take his place as a professional specialist in the design of interior space. As such, he expects to assume a responsible role among those who shape physical environment. His primary interest in the development of interiors is concerned with the social, historical and technical implications of these aspects of space, surface and material which distinguish his work. His training will enable him to develop a practice as a private consultant, as a designer of furniture and textiles, and as a valuable associate of the environmental design team.

Curriculum in Interior Design (ID)

FIRST YEAR		
First Quarter	Second Quarter	Third Quarter
AR 110 Design Fundamentals _____ 5	AT 105 Drawing I _____ 5	AR 111 Design Fundamentals _____ 5
EH 101 English Comp. _____ 3	EH 102 English Comp. _____ 3	EH 103 English Comp. _____ 3
HY 101 World History _____ 3	HY 102 World History _____ 3	EH 103 World History _____ 3
MH 159 Pre. Cal. w/o Trig. _____ 5	MH 161 An. Geom. & Cal. _____ 5	Nat. Sci. Elect. _____ 5
PE Physical Education _____ 1	PE Physical Education _____ 1	PE Physical Education _____ 1
TH 101 Intr. to Arts _____ 1	TH 102 Intr. to Arts _____ 1	TH 103 Intr. to Arts _____ 1

SECOND YEAR**First Quarter**

AR 201	Architectural Design	5
AR 215	Elements of I.D.	3
	Nat. Sci. Elect.	5
AR 361	Hist. & Theory of Arch.	3

Second Quarter

AR 202	Architectural Design	5
AR 216	Elements of I.D.	3
AR 362	Hist. & Theory of Arch.	3
PG 211	Psychology	3
EC 200	Gen. Economics	5

Third Quarter

AR 203	Architectural Design	5
AR 363	Hist. & Theory of Arch.	3
AR 217	Elements of I.D.	3
SY 201	Sociology	5
	Elective	3

THIRD YEAR

AR 305	Interior Design	5
AR 365	Period Interiors	5
AR 364	Hist. & Theory of Arch.	3
CA 415	History of Textiles	5

AR 306	Interior Design	5
AR 366	Period Interiors	5
	Elective	3
	Elective	3

AR 307	Interior Design	5
AR 367	Contemporary Interiors	3
	Elective	3
EC 331	Marketing	5

FOURTH YEAR

AR 405	Interior Design	5
AR 441	Professional Prac.	3
FL	Foreign Language	5
CA 345	Creative Crafts	3

AR 406	Interior Design	5
AR 408	Interior Design Res.	2
FL	Foreign Language	5
AT	Art History	5

AR 407	Interior Design (thesis)	7
AT	Art History	5
	Elective	5

Total — 208 quarter hours

Two months of practical experience with a professional interior designer is required between the 3rd and 4th year.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

Industrial Design

Industrial Design is concerned primarily with the practical and aesthetic relation of products and systems to those who use them. The Industrial Designer as a leading member of a research and development team — composed of engineers, scientists, and designers — is responsible for the product's shape, color, proportion, and texture, or for the optimum interaction between each item in a system. He is deeply concerned with such factors of use as efficiency, convenience, safety, comfort, maintenance, and cost.

The Industrial Designer's activity encompasses areas such as product design, transportation design, industrialized building, package design, exhibition design, and systems design.

The student of Industrial Design learns, for example, the basic principles of design, engineering, human factors designing, marketing, and sociology. He acquires such technical skills as drafting, model-making, photographing and sketching techniques. He is introduced to design methods, product planning, statistics, materials, manufacturing methods, consumer psychology, and environmental studies.

The four-year curriculum leads to the professional degree of Bachelor of Industrial Design. The program is approved by the Industrial Designers Society of America. Graduates will qualify for positions in industrial design consultant offices and in various industries.

The cooperative education program is also offered. For more information refer to page 47.

Curriculum in Industrial Design (IND)

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
AR 110 Design Fund.	5	AT 105 Drawing I	5	AR 111 Design Fund.	5
EH 101 English Comp.	3	EH 102 English Comp.	3	EH 103 English Comp.	3
HY 101 History	3	HY 102 History	3	HY 103 History	3
TH 101 Intr. to Arts	1	TH 102 Intr. to Arts	1	TH 103 Intr. to Arts	1
MH 159 Pre-Cal. Math.	5	MH 161 An. Geom. & Cal.	5	TS 102 Engr. Drawing I	2
PE Physical Education	1	PE Physical Education	1	TS 112 Welding Science	1
				TS 111 Woodworking	1
				PE Physical Education	1

SOPHOMORE YEAR

IND 210 Industrial Design	5	IND 211 Industrial Design	5	IND 212 Industrial Design	5
IND 221 Mats. & Technology	5	IND 222 Tech. Illustration	5	IND 223 Industrial Des.	5
PG 211 Psychology I	3	TS 105 Engr. Drawing II	2	Method	5
TS 104 Descr. Geometry	2	TS 113 Machine Tool Lab.	1	TS 204 Kinematics of Mach.	3
TS 114 Sheetmetal Design	1	TS 115 Foundry Tech.	1	PS 204 Found. of Physics	5
CH 101 Intr. to Chemistry	2	CH 102 Intr. to Chemistry	2		
		CH 103L Gen. Chem. Lab.	1		

JUNIOR YEAR

IND 310 Industrial Design	5	IND 311 Industrial Design	5	IND 312 Industrial Design	5
EC 200 Economics I	5	AT 338 Art History I	5	MT 331 Prin. of Marketing	5
Elective	3	TS 308 Gages & Measurements	5	IND 308 Design Workshop	5
Elective	5	Elective	3	Elective	3

SENIOR YEAR

IND 410 Industrial Design	6	IND 411 Industrial Design	6	IND 412 Ind. Des. Thesis	6
PG 461 Industrial Psych.	5	IND 415 History of Ind. Design	5	IND 485 Seminar in Ind. Design	5
Elective	3	Elective	5	SY 408 Industrial Sociology	5
PG 490 Human Factors	4				

Total — 210 quarter hours

Electives must come from the list of approved electives in Science and the Humanities.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

Graduate Work in Industrial Design

Students who hold a bachelor's degree, are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Industrial Design degree. For details see the Bulletin of the Graduate School.

Department Of Art

The Department of Art offers curricula designed to provide training for those who wish to become professional designers, practitioners in the fine arts, or artist-teachers. It also offers courses for education majors specializing in art and for students who seek general knowledge and appreciation of the visual arts. The program of studio courses is combined with studies of the functions and historical background of the visual arts. Courses in general education promote in the student a comprehension of his responsibilities to the society and culture in which he lives.

Two curricula are offered: *Fine Arts and Visual Design*, each leading to the degree of Bachelor of Fine Arts. The first two years of the two curricula are similar. Emphasis is given to a fundamental grasp of basic art principles with the aim of stimulating a creative use of the elements involved. Following these basic years, curriculum content varies as the student enters into his professional field.

Students in the School of Education may elect a minor or a major in Art (see page 146). Students in the School of Arts and Sciences may elect a minor (15 hours), a double minor (30 hours), or B.A. with Art Major (70 hours).

The Department of Art is an accredited member of the National Association of Schools of Art, and a member of the College Art Association.

Fine Arts

Following two years of basic studies, the student, with faculty approval, enters advanced courses in painting, sculpture and printmaking. Preferences are emphasized through art electives and through academic electives from other areas of the University.

Graduates in Fine Arts may elect to practice in their chosen fields or to teach in professional areas at advanced levels. Students who contemplate teaching as a career should plan to work toward a Master of Fine Arts or other master's degree at this or another institution.

Curriculum in Fine Arts (FA)

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
AT 105 Drawing I	5	AT 106 Drawing II	5	AT 107 Drawing III	5
AT 181 Design		AT 115 Perspective	3	AT 182 Design	
Fundamentals	5	EH 102 English Comp.	3	Fundamentals	5
EH 101 English Comp.	3	HY 102 World History	3	EH 103 English Comp.	3
HY 101 World History	3	TS 112 Welding Science		HY 103 World History	3
Basic ROTC or Elec.	1	and Appl.	1	Basic ROTC or Elec.	1
PE Physical Education	1	Basic ROTC or Elec.	1	PE Physical Education	1
		PE Physical Education	1		

SECOND YEAR

AT 205 Figure Drawing I	5	AT 215 Figure Const.	5	AT 227 Sculpture I	5
AT 222 Painting I	5	AT 224 Painting II	5	*BI 101 Prin. of Biology	5
*MH 100 Mathematical		*SY 201 Intr. to Soc.	5	†SY 207 Intr. Archaeology	5
Insights	5	PG 212 Psychology II	3	PA 210 Intr. Philo.	
Science elective	3	Basic ROTC or Elec.	1	Probs.	3
Basic ROTC or Elec.	1			Basic ROTC or Elec.	1

THIRD YEAR

AT 338 Art History I	5	AT 339 Art History II	5	AT 340 Art History III	5
AT 305 Printmaking I	5	AT 307 Figure Dwg. II	5	AT 322 Painting III	5
*BI 104 Bio. in Human		AT 327 Sculpture II	5	AT Art Studio Elec.	5
Affairs	5	EH 253 Lit. in English	3	EH 254 Lit. in English	3
PA 216 Philo. of Man	3	FY 210 Wood and Art	1		

FOURTH YEAR

AT 405 Printmaking II	5	AT 427 Sculpture III	5	Art Studio Elec.	5
AT Art Studio Elec.	5	AT Art Studio Elec.	5	Elective	5
Elective	5	Elective	5	AT 496 Thesis	5

Total — 210 quarter hours

*Suggested options for liberal education elective requirements may be found on page 65. A minimum of 20 credit hours must be taken in the two academic areas of Mathematics/Natural Sciences and Social Sciences, with at least one course in each area.

NOTE: Advanced Military Science amounting to six credit hours may be used as part of the above 20 hours requirement.

†SY 203 Cultural Anthropology (5) is a suggested alternate.

Graduate Work in Fine Arts

Students who hold the degree of Bachelor of Fine Arts, or a similar degree, are eligible to apply to the Dean of the Graduate School for admission to the graduate course leading to the Master of Fine Arts degree. For details examine the Bulletin of the Graduate School.

ART STUDIO ELECTIVES:	AT 421 Painting IV
	AT 422 Painting V
	AT 423 Painting VI
	AT 406 Printmaking III
	AT 407 Printmaking IV
	AT 408 Printmaking V
	AT 428 Sculpture IV

Visual Design

The program in Visual Design gives fundamental training in the techniques of visual communication. Following the two year course in basic art principles, and with faculty approval, the student enters Visual Design. A core curriculum emphasizes the techniques of drawing for reproduction, lettering and typographical layout. The student is encouraged to think creatively within the limits of materials and processes. Beginning the third year, the student develops special interests in painting, printmaking, sculpture, illustration or fashion through a series of art electives. A balanced group of academic subjects helps to further an understanding of the function of design in commerce and industry. This breadth of background increases the possibility of future advancement to administrative work.

Curriculum in Visual Design (VD)

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
AT 105 Drawing I	5	AT 106 Drawing II	5	AT 107 Drawing III	5
AT 181 Design Fundamentals I	5	AT 113 Perspective	3	AT 182 Design Fundamentals II	5
EH 101 English Comp.	3	TS 102 Engineering Dwg.	2	EH 103 English Comp.	3
HY 101 World History	3	EH 102 English Comp.	3	HY 103 World History	3
Basic ROTC or Elec.	1	HY 102 World History	3	Basic ROTC or Elec.	1
PE Physical Education	1	Basic ROTC or Elec.	1	PE Physical Education	1

SECOND YEAR

AT 211 Lettering	5	AT 205 Figure Drawing I	5	AT 215 Figure Construction	5
AT 227 Sculpture I	5	AT 212 Graphic Processes	5	AT 224 Painting II	5
*PA 210 Intr. to Phil. Prob.	3	AT 222 Painting I	5	EH 253 English Lit.	3
*BI 101 Prin. of Biology	5	*PA 216 Phil. of Man	5	*BI 104 Bio. in Human Affairs	5
Basic ROTC or Elec.	1	Basic ROTC or Elec.	1	Basic ROTC or Elec.	1

THIRD YEAR

AT 381 Visual Design I	5	AT 382 Visual Design II	5	AT 383 Visual Design III	5
AT 307 Figure Drawing II	5	AT 355 Illustration I	5	AT 361 Fashion I	5
AT 338 Art History I	5	AT 339 Art History II	5	EC 200 General Economics	5
Science elective	3	PG 212 Psychology II	3	EH 254 English Lit.	3

FOURTH YEAR

AT 481 Visual Design IV	5	AT Art Studio Elec.	5	AT 496 Thesis	5
AT Art Studio Elec.	5	*MH 100 Math. Insights	5	Elective	5
MT 331 Prin. of Marketing	5	AT 340 Art History III	5	Elective	5

Total — 210 quarter hours

*Suggested options for liberal education elective requirements may be found on page 65. A minimum of 20 credit hours must be taken in the two academic areas of Mathematics/Natural Sciences and Social Sciences, with at least one course in each area.

NOTE: Advanced Military Science amounting to six credit hours may be used as part of the above 20 hours requirement.

ART STUDIO ELECTIVES:

AT 322 Painting III	AT 405 Printmaking II
AT 421 Painting IV	AT 406 Printmaking III
AT 422 Painting V	AT 407 Printmaking IV
AT 423 Painting VI	AT 408 Printmaking V
AT 462 Fashion II	AT 327 Sculpture II
AT 463 Fashion III	AT 427 Sculpture III
AT 482 Visual Design V	AT 428 Sculpture IV
AT 456 Illustration II	

Department Of Building Technology

The purpose of the curriculum in Building Technology is to develop professionally knowledgeable practitioners and managers for a wide variety of roles in the construction industry.

The Department of Building Technology offers courses in the design of structural and mechanical systems for buildings, construction procedures, building cost estimation and construction management. The curriculum leads to the degree of Bachelor of Building Construction.

Curriculum in Building Construction (BC)

FIRST YEAR

First Quarter

BT 101	Intr. to Building	3
EH 101	English Comp.	3
*HY 101	World History	3
MH 160	Pre. Cal. w. Trig.	5
PE	Physical Education	1
	Elective	1

Second Quarter

BT 102	Drawing & Proj.	3
EH 102	English Comp.	3
*HY 102	World History	3
MH 161	An. Geom. & Cal.	5
PE	Physical Education	1
	Elective	1

Third Quarter

BT 206	Matls. & Constr.	5
EH 103	English Comp.	3
*HY 103	World History	3
MH 162	An. Geom. & Cal.	5
PE	Physical Education	1
	Elective	1

SECOND YEAR

BT 220	Intr. to Structures	3
PS 205	Physics	5
EC 200	Gen. Economics	5
	Group Elective	5

BT 361	Hist. of Bldg. I	3
BT 221	Mech. of Structures	5
PS 206	Physics	5
	Group Elective	5

BT 362	Hist. of Bldg. II	3
BT 311	Structures I	3
ACF 211	Intr. Acct.	5
	Computer Elective	3
	Elective	5

THIRD YEAR

BT 321	Constr. Prob. I	5
BT 312	Structures II	3
BT 363	Hist. of Bldg. III	3
ACF 212	Intr. Acct.	5
SC 202	App. Sp. Comm.	3

BT 322	Constr. Prob. II	5
BT 313	Structures III	3
BT 364	Hist. of Bldg. IV	3
	Group Elective	5
	Elective	3

EC 445	Indus. Relations	5
BT 411	Structures IV	3
BT 412	Structures V	3
	Group Electives	8

FOURTH YEAR

BT 433	Constr. Methods & Estimating I	5
BT 413	Structures VI	5
	Group Elective	5
	English Elective	3

BT 434	Constr. Meth. & Estimating II	5
BT 452	Bdg. Equip. I	3
	Group Electives	10

BT 490	Building Const. Thesis	7
BT 453	Bldg. Equip. II	5
	Elective	1

Total — 209 quarter hours

*HY 204, 5, 6 or EH 260, 1, 2 may be substituted for HY 101, 2, 3.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

Group Electives must be selected from lists approved by the Department. These lists will guide the student in one of four areas of concentration: Construction Management, Structural Systems for Buildings, Mechanical Systems for Buildings, or a General coverage of these three fields plus additional work in the Humanities and Social Sciences.

Department Of Music

The Department of Music provides instruction and performing experience to students interested in developing their talents in music. The courses of study provided by the Department have been created to present a balance between creative skills and academic studies, allowing at the same time a certain flexibility to meet individual requirements.

The Department of Music offers to the Music major a professional curriculum leading to the degree Bachelor of Music, with majors in (A) Applied Music, (B) Theory and Composition, (C) Church Music. These programs provide preparation for the professional field of performance and for private or

college teaching of applied music, theory, and composition. They also provide training for church organists and choir directors.

For the student wishing to major in Music History and Literature, the Department of Music offers a program of studies leading to the Bachelor of Arts degree. This degree is a cultural, not a professional degree.

Many general elective courses are available to all University students as well as courses in applied music in band and orchestral instruments, voice, piano, and organ. Performance groups such as the Marching and Concert Bands, Orchestra, Glee Clubs, Concert Choir, Choral Union, and Opera Workshop are also available to students in all curricula.

Professional Curriculum in Music (MU)

(A) Applied Music Major

FIRST YEAR

First Quarter

EH 101	English Comp.	3
HY 101	World History	3
MU 131	Mat. & Org. of Music	5
MU 181	Applied Music (major)	3
MU 187	Applied Music (minor)	1
MU	Performing Group	1
PE	Physical Education	1
MU 100	Convocation	0

Second Quarter

EH 102	English Comp.	3
HY 102	World History	3
MU 132	Mat. & Org. Mu.	5
MU 182	Applied (major)	3
MU 188	Applied (minor)	1
MU	Perf. Group	1
PE	Physical Education	1
MU 100	Convocation	0

Third Quarter

EH 103	English Comp.	3
HY 103	World History	3
MU 133	Mat. & Org. Mu.	5
MU 183	Applied (major)	3
MU 189	Applied (minor)	1
MU	Perf. Group	1
PE	Physical Education	1
MU 100	Convocation	0

SECOND YEAR

MU 231	Mat. & Org. of Music	5
	Natural Science	5
MU 281	Applied Music (major)	3
MU 287	Applied Music (minor)	1
MU	Performing Group	1
MU	Ensemble	1
MU 100	Convocation	0

MU 232	Mat. & Org. Mu.	5
	Natural Science	5
MU 282	Applied (major)	3
MU 288	Applied (minor)	1
MU	Perf. Group	1
MU	Ensemble	1
MU 100	Convocation	0
	Elective	3

MU 233	Mat. & Org. Mu.	5
MH 100	Mathematics	5
MU 285	Applied (major)	3
MU 289	Applied (minor)	1
MU	Perf. Group	1
MU	Ensemble	1
MU 100	Convocation	0
	Elective	3

THIRD YEAR

MU 331	Mat. & Org. Music	5
PA 211	Philosophy	3
MU 351	Music History	3
MU 381	Applied Music (major)	3
MU	Ensemble	1
MU 100	Convocation	0
	Elective (Social or Natural Science)	3

MU 332	Mat. & Org. Mu.	5
PA 212	Philosophy	3
MU 352	Music History	3
MU 382	Applied (major)	3
MU	Ensemble	1
MU 100	Convocation	0
	Elective (Soc. or Nat. Science)	3

MU 333	Mat. & Org. Mu.	5
MU 361	Conducting	3
MU 353	Music History	3
MU 383	Applied (major)	3
MU 100	Convocation	0
	Elective (Soc. or Nat. Science)	3

FOURTH YEAR

FL	Foreign Language	5
MU 481	Applied Music (major)	3
MU 337	Modern Harmony	3
MU	Ensemble	1
MU 100	Convocation	0
	Elective (Soc. or Natural Science)	6

FL	Foreign Language	5
MU 482	Applied (major)	3
MU	Pedagogy	3
MU	Ensemble	1
MU 362	Conducting	1
MU 100	Convocation	0
	Elective	3

FL	Foreign Language	5
MU 483	Applied (major)	3
MU	Ensemble	1
MU 363	Conducting	1
MU 100	Convocation	0
	Elective	3

Total — 205 quarter hours

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

(B) Theory and Composition Major**FIRST YEAR**

First Quarter		Second Quarter		Third Quarter	
EH 101 English Comp.	3	EH 102 English Comp.	3	EH 103 English Comp.	3
HY 101 World History	3	HY 102 World History	3	HY 103 World History	3
MU 131 Mat. & Org. Music	5	MU 132 Mat. & Org. Mu.	5	MU 133 Mat. & Org. Mu.	5
MU 184 Applied Music	1	MU 185 Applied Music	1	MU 186 Applied Music	1
MU 116 Woodwind Instr.	1	MU 117 Woodwind Instr.	1	MU 118 WW Instr.	1
MU 110 String Instr.	1	MU 111 String Instr.	1	MU 112 String Instr.	1
PE Physical Education	1	MU Perf. Group	1	MU Perf. Group	1
MU 100 Convocation	0	PE Physical Education	1	PE Physical Education	1
		MU 100 Convocation	0	MU 100 Convocation	0
				Elective	3

SECOND YEAR

MU 231 Mat. & Org. of Music	5	MU 232 Mat. & Org. Mu.	5	MU 233 Mat. & Org. Mu.	5
Natural Sciences	5	Natural Science	5	MH 100 Mathematics	5
MU 284 Applied Music	1	MU 285 Applied Music	1	MU 286 Applied Music	1
MU 113 Brass Instr.	1	MU 114 Brass Instr.	1	MU 115 Brass Instr.	1
MU 107 Voice Class	1	MU 108 Voice Class	1	MU 119 Percussion In.	1
PG 211 Psychology	3	PG 212 Psychology	3	MU Perf. Group	1
MU Perf. Group	1	MU Perf. Group	1	MU Ensemble	1
MU Ensemble	1	MU Ensemble	1	MU 100 Convocation	0
MU 100 Convocation	0	MU 100 Convocation	0	Elective	3

THIRD YEAR

MU 331 Mat. & Org. Music	5	MU 332 Mat. & Org. Mu.	5	MU 333 Mat. & Org. Mu.	5
MU 351 Music History	3	MU 352 Music History	3	MU 353 Music History	3
MU Modern Harmony I	3	MU Modern Harm. II	3	MU Modern Harm. III	3
MU 437 Orchestration	3	MU 438 Orchestration	3	MU 389 Applied Music	1
MU 387 Applied Music	1	MU 388 Applied Music	1	MU Perf. Group	1
MU Perf. Group	1	MU Perf. Group	1	MU 100 Convocation	0
MU 100 Convocation	0	MU 100 Convocation	0	Elective (Soc. or Nat. Science)	6
Elective (Soc. or Nat. Science)	3	Elective (Soc. or Nat. Science)	3		

FOURTH YEAR

MU 434 Music Comp.	3	MU 435 Music Comp.	3	MU 436 Music Comp.	3
FL Foreign Language	5	FL Foreign Language	5	FL Foreign Language	5
MU 487 Applied Music	1	MU 488 Applied Music	1	MU 489 Applied Music	1
MU 439 Orchestration	3	MU 445 Theory Pedagogy	3	MU Perf. Group	1
MU Perf. Group	1	MU Perf. Group	1	MU 100 Convocation	0
MU 100 Convocation	0	MU 100 Convocation	0	Elective	3
Elective (Soc. or Nat. Science)	6	Elective	3		

Total — 209 quarter hours

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

(C) Church Music Major**FIRST YEAR**

First Quarter		Second Quarter		Third Quarter	
EH 101 English Comp.	3	EH 102 English Comp.	3	EH 103 English Comp.	3
HY 101 World History	3	HY 102 World History	3	HY 103 World History	3
MU 131 Mat. & Org. Music	5	MU 132 Mat. & Org. Mu.	5	MU 133 Mat. & Org. Mu.	5
MU 181 Applied Music (major)	3	MU 182 Applied (major)	3	MU 183 Applied (major)	3
MU 187 Applied Music (minor)	1	MU 188 Applied (minor)	1	MU 189 Applied (minor)	1
MU Ensemble	1	MU Ensemble	1	MU Ensemble	1
PE Physical Education	1	PE Physical Education	1	PE Physical Education	1
MU 100 Convocation	0	MU 100 Convocation	0	MU 100 Convocation	0

SECOND YEAR

Natural Science	5	Natural Science	5	MH 100 Mathematics	5
MU 231 Mat. & Org. Music	5	MU 232 Mat. & Org. Mu.	5	MU 233 Mat. & Org. Mu.	5
MU 281 Applied Music (major)	3	MU 282 Applied (major)	3	MU 283 Applied (major)	3
MU 287 Applied Music (minor)	1	MU 288 Applied (minor)	1	MU 289 Applied (minor)	1
MU Ensemble (or MU 211)	1	MU Ensemble	1	MU Ensemble	1
MU 100 Convocation	0	MU 100 Convocation	0	MU 100 Convocation	0
Elective	3	Elective	3	Elective	3

THIRD YEAR**First Quarter**

Philosophy	3
MU 351 Music History	3
MU 331 Mat. & Org. Music	5
MU 381 Applied Music (major)	3
MU 312 Hymnology	5
MU Ensemble	1
MU 100 Convocation	0

Second Quarter

Philosophy	3
MU 352 Music History	3
MU 332 Mat. & Org. Mu.	5
MU 382 Applied (major)	3
MU 311 Liturgies	3
MU Ensemble	1
MU 100 Convocation	0

Third Quarter

MU 353 Music History	3
MU 333 Mat. & Org. Mu.	5
MU 383 Applied (major)	3
MU Ensemble	1
MU 100 Convocation	0
Elective (Soc. or Nat. Science)	6

FOURTH YEAR

FL Foreign Language	5
MU 361 Conducting	3
MU 381 Applied Music (major)	3
MU Ensemble	1
MU 100 Convocation	0
Elective (Soc. or Nat. Science)	6

FL Foreign Language	5
MU 415 Organ Lit.	3
or	
Vocal pedagogy	
MU 482 Applied (major)	3
MU 362 Conducting	1
MU Ensemble	1
MU 100 Convocation	0
Elective (Soc. or Nat. Science)	5
Elective	2

FL Foreign Language	5
MU 416 Church Mu.	
Seminar	3
MU 483 Applied (major)	3
MU Ensemble	1
MU 453 Choral Lit.	3
MU 100 Convocation	0

Total — 210 quarter hours

Bachelor of Arts**FIRST YEAR****First Quarter**

MU 131 Mat. & Org. Music	5
EH 101 English Comp.	3
HY 101 World History	3
MU 184 Applied Music	1
MU Ensemble	1
PE Physical Education	1
MU 100 Convocation	0

Second Quarter

MU 132 Mat. & Org. Mu.	5
EH 102 English Comp.	3
HY 102 World History	3
MU 185 Applied	1
PA 211 Philosophy	3
MU Ensemble	1
PE Physical Education	1
MU 100 Convocation	0

Third Quarter

MU 133 Mat. & Org. Mu.	5
EH 103 English Comp.	3
HY 103 World History	3
MU 186 Applied	1
MU Ensemble	1
MH 100 Mathematics	5
MU 100 Convocation	0

SECOND YEAR

MU 231 Mat. & Org. Music	5
Natural Science	5
EH 253 English Lit.	3
MU 284 Applied Music	1
MU Ensemble	1
PE Physical Education	1
MU 100 Convocation	0

MU 232 Mat. & Org. Mu.	5
Natural Science	5
EH 253 English Lit.	3
MU 285 Applied	1
MU Ensemble	1
MU 100 Convocation	0
Elective	3

MU 233 Mat. & Org. Mu.	5
EH 255 English Lit.	3
MU 286 Applied	1
MU Ensemble	1
AT 338 Art History	5
MU 100 Convocation	0
Elective	3

THIRD YEAR

MU 331 Mat. & Org. Music	5
MU 351 Music History	3
*MU 384 Applied Music	1
PA 212 Philosophy	3
MU 100 Convocation	0
Academic Minor	5

MU 332 Mat. & Org. Mu.	5
MU 352 Music History	3
MU 385 Applied	1
MU 100 Convocation	0
Academic Minor	5
Elective (Soc. or Nat. Science)	3

MU 333 Mat. & Org. Mu.	5
MU 353 Music History	3
MU 386 Applied	1
MU 100 Convocation	0
Academic Minor	5
Elective (Soc. or Nat. Science)	3

FOURTH YEAR

PG 211 Psychology	5
MU 489 Applied Music	1
FL Foreign Language	5
MU 100 Convocation	0
*Academic Minor	5
Elective (Soc. or Nat. Science)	3

MU 361 Conducting	3
MU 485 Applied	1
FL Foreign Language	5
MU 100 Convocation	0
Academic Minor	5
Elective (Soc. or Nat. Science)	3

MU 486 Applied	1
FL Foreign Language	5
MU 100 Convocation	0
Academic Minor	5
Elective (Soc. or Nat. Science)	3

Total — 202 quarter hours

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

*A minor of 30 quarter hours elected from approved courses.

Keyboard proficiency is required for non-keyboard majors. In such cases three of the applied music credits will be taken in piano.

Supplementary Requirements for Bachelor of Music and Bachelor of Arts Degree Candidates

1. Attendance at campus music functions and student convocations is compulsory. Absences may be excused only by the Head of the Music Department.

2. At the end of the Sophomore year a comprehensive examination will be given which must be passed before the student is admitted to the upper division music courses. Transfer students must complete this examination to receive junior standing.

3. A. Students electing the applied music major must present a junior recital during the third year of study and a senior recital during the fourth year of study.

B. Students electing the theory and composition major must present an original composition in small form during the third year of study and an original composition in large form during the fourth year of study.

C. Students electing the history and literature major must present a written thesis during the fourth year of study.

D. Students electing the church music major must present a senior recital during the fourth year of study.

4. Credit in applied music is based on the amount of practice, each credit hour requiring a minimum of five hours practice per week.

5. Students whose major performing medium is not piano or organ must elect piano as the minor instrument. Before graduation all students must meet minimum Sophomore NASM applied music requirements in piano.

6. Participation in an approved music performing group is required each quarter, with or without credit.

7. All students taking applied music must meet public performance requirements as designated by the faculty. (See Music Dept. special regulations regarding requirements for jury examinations and convocation performances.)

Music Education

Teacher Education: Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Architecture and Fine Arts to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the professional curriculum in music, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued. It is considered desirable for students who wish to engage in junior high or high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the Department of Music. The advisers will counsel in their respective areas. Flexibility in scheduling student course requirements is to be permitted in the pursuit of the requirements for both curriculum in music and Teacher Education training.

Music Organizations

Several musical organizations, sponsored by the University and directed by the Department of Music, provide excellent training in group music. See index under "Organizations." These activities, which are open to students of the University, may be taken with or without credit.

Graduate Work in Music

Admission to graduate work toward the Master of Music Degree requires a Bachelor's degree in music, music education, or the equivalent from this or another recognized institution. Admission to graduate study in the Music Department shall be in accordance with policies of the Graduate School. In addition, all candidates must take entrance examinations in music theory and history administered by members of a Departmental Screening Committee, demonstrate competency at the keyboard, and fulfill additional requirements as follow:

Instrumental Majors — Audition

Voice Majors — Audition and demonstration of satisfactory diction in Italian, French, and German.

(See graduate catalogue for details)

Students who hold a baccalaureate degree in Education with a Major in Music are eligible to apply to the Dean of the Graduate School for admission to the graduate courses leading to the degrees Master of Science and Master of Education with Major in Music. The candidate must complete satisfactorily the following curriculum totaling 45 quarter hours.

Education and Foundation Courses	15
Music and Music Education Courses	30

Department Of Theatre

The purpose of the theatre curriculum at Auburn University is to develop creative and knowledgeable practitioners and teachers of the theatre art. The program is organized to provide a broad range of performance and classroom experiences so that the technical training and academic discipline gained thereby will prepare the student for creative work in the theatre wherever it may be undertaken, professionally or academically.

The program emphasizes the fact that theatre is a *discipline*, involving (1) natural endowment, (2) study, and (3) exercise or practice. While natural endowment is not under the control of the faculty, it is recommended that only those students who show evidence of abilities in theatre art should pursue the major. Each student will be given ample opportunity to explore his personal resources. Through course work and laboratories, he will have the opportunity to develop sound foundations in the various elements of the theatre art—play-writing, directing, acting, and designing—on the basis of which he may perfect his natural abilities.

Thus, performance and classroom study are considered of equal and complementary value to the student's theatre training. For the produced play is the experience that most nearly unites all that is contained in "theatre art." Play production is the principal means available for the coordination of all the theatrical elements, for drama and theatre can best be comprehended and appreciated in combination rather than in isolation from each other. Therefore, study combined with practice and continuous application in the production program of the Auburn University Theatre are required.

The Department offers a B.A. degree with a major in Theatre, which may also be taken as a major or minor in the School of Education or as a minor in

any of the three options in the School of Arts and Sciences. Those wishing to minor should consult the Department for its specific recommendation. The Department also offers general elective courses in Theatre practice and theory. Students planning to teach in elementary and secondary schools are encouraged to complete the Department's courses in Children's Theatre, Creative Dramatics, and Theatre in the School. Although the objectives of students may vary, those completing the degree programs should reach competence as either instructors or performers in their specific areas of emphasis in theatre.

Curriculum in Theatre (TH)

FIRST YEAR

First Quarter

EH 101	English Comp.	3
HY 101	World History	3
BI 101	Prin. of Biology	5
TH 101	Intr. to the Arts	1
TH 104	Intr. to Theatre I	3
TH 107	Stage Craft I	1
PE	Physical Education	1

Second Quarter

EH 102	English Comp.	3
HY 102	World History	3
BI 104	Biology in Human Affairs	5
TH 102	Intr. to the Arts	1
TH 105	Intr. to Theatre II	3
TH 108	Stage Craft II	1
PE	Physical Education	1

Third Quarter

EH 103	English Comp.	3
HY 103	World History	3
PA 210	Intr. to Philosophy	3
TH 103	Intr. to the Arts	1
TH 106	Intr. to Theatre III	3
TH 109	Stage Craft III	1
PE	Physical Education	1
	Elective	3

SECOND YEAR

TH 204	Fund. of Acting I: Voice	5
TH 201	Theatre Artist in Society	3
PA 211	Intr. to Deductive Logic or	3
PA 216	Philosophies of Man	3
EH 253	English Lit.	3
TH 111	Theatre Practice	1
	Elective	3

TH 205	Fund. of Acting II: Movement	5
TH 207	Stage Make-up	3
PG 211	Psychology	3
EH 254	English Lit.	3
TH 111	Theatre Practice	1
	Elective	3

TH 206	Acting	5
TH 203	Theories of Acting	3
PG 212	Psychology II	3
EH 255	English Lit.	3
TH 111	Theatre Practice	1
	Elective	3

THIRD YEAR

TH 304	Fund. Stage Design	5
TH 301	Hist. of Theatre in Wstrn Civilization	3
AT 338	Art History I	5
MU 373	Apprec. of Music	3
TH 199	Theatre Lab.	2

TH 305	Design in the Theatre I	5
TH 302	Hist. of Theatre in Wstrn Civilization	3
AT 339	Art History II	5
	Elective in Music	3
TH 199	Theatre Lab.	2

TH 306	Design in the Theatre II	5
TH 303	Hist. of Theatre in Wstrn Civilization	3
EH 361	Hist. of Eng. Drama	5
TH 199	Theatre Lab.	2
	Elective	2

FOURTH YEAR

EH 451	Shakespeare	5
TH 401	Play Analysis	3
TH 404	Directing I	5
TH 111	Theatre Practice	1
	Gen. Elective	4

EH 452	Shakespeare	5
TH 405	Directing II	5
TH 414	Modern Theatre Backgrounds	3
TH 111	Theatre Practice	1
	Gen. Elective	3

EH 353	Contemporary Drama or	5
EH 492	American Drama	5
TH 406	Directing III	5
TH 403	Seminar in Theatre Research	3
TH 111	Theatre Practice	1
	Gen. Elective	2

Total — 210 quarter hours

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for twelve hours of general electives.

School of Arts and Sciences

EDWARD H. HOBBS, *Dean*

LESLIE CAMPBELL, *Assistant Dean*

IN THE SCHOOL OF ARTS AND SCIENCES a student can gain a broad general education and also acquire depth in the particular field in which he majors. This combination equips him with a strong foundation for post-baccalaureate specialization in graduate studies or professional school. A further function of this school is to provide courses which are needed by students of all other instructional divisions of the University to meet their various educational objectives.

The School of Arts and Sciences is the oldest school in Auburn University, tracing its origin to 1859 and the Academic Faculty of East Alabama Male College, predecessor of Auburn University. It was known as the School of Science and Literature from 1929 to 1968, when it became the School of Arts and Sciences. Three academic areas — humanities, physical sciences, and social sciences — are represented by the School's 12 departments — Chemistry, English, Foreign Languages, Geology, History, Mathematics, Philosophy, Physics, Political Science, Psychology, Sociology, and Speech Communication.

Three Curriculum Areas

The School of Arts and Sciences offers four-year bachelor's degree programs in three curriculum areas: (1) *general*, (2) *pre-professional*, and (3) *special*.

The *General Curriculum* offers options in 17 major fields, with a wide choice of minors available both within the School of Arts and Sciences and in other schools of the University.

Pre-professional Programs are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-hospital administration, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine.

Special Curricula are available in chemistry, geology, laboratory technology, law enforcement, mathematics, physics, applied physics, and public administration.

If the student follows the curricula offered by the School of Arts and Sciences he will meet the basic requirements of the University-wide Liberal Education Program.

Advisory Services for Students

The head of the department (or his designate) in which the student majors becomes the student's adviser and is charged with the responsibility of outlining the student's major and minor work. The Office of the Dean, however, provides counseling services to the student before he declares a major. For pre-professional students, counseling on professional school admission tests, admissions

requirements and other such matters is provided as follows: Pre-dental-Premedical Advisory Committee for pre-dental and pre-medical students, the Pre-Law Adviser, the Pre-Optometry Adviser, the Pre-Hospital Administration Adviser, the Pre-Occupational Therapy Adviser, the Pre-Physical Therapy Adviser, the Pre-Pharmacy Adviser, and the Pre-Veterinary Medicine Advisers. Advisory services for special curricula and for the Teacher Education Program are provided by the appropriate departments.

Teacher Education

Through the Dual Objectives Program a student in the School of Arts and Sciences may prepare for a career as a secondary school teacher with a major in art, biology, chemistry, economics, English, foreign language, geography, history, mathematics, physics, political science, speech communication, or sociology.

Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Arts and Sciences to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the General Curriculum, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued.

It is desirable for students who wish to engage in junior high or senior high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be counseled by a professional education adviser in the School of Education and an academic adviser in the School of Arts and Sciences.

Cooperative Education Programs

Cooperative Education Programs which give students an opportunity to integrate their academic training with work experience are offered in mathematics, physics, applied physics, and political science. Students alternate each quarter between school and a work assignment provided through the Director of the Cooperative Education Program. For further information about this program, interested students should write to the Director, Cooperative Education, Auburn University, Auburn, Alabama 36830. (See page 47).

Graduate Degrees

Master of Arts degrees are offered in the areas of English, history, political science, Spanish, and speech communication. Master of Science degrees are offered in the areas of chemistry, mathematics, physics, and psychology. In addition, a Master of Political Science degree is offered at Air University in Montgomery, Alabama, through the Department of Political Science of Auburn University, and the School of Arts and Sciences participates in the offering of two interdisciplinary degrees, Master of Arts in College Teaching and Master of Urban and Regional Planning. Doctor of Philosophy degrees are offered in the areas of chemistry, English, history, mathematics, physics, and psychology. Degree programs are described in the *Graduate School Bulletin*.

The General Curriculum (GC)

The general curriculum is designed to broaden the student through the humanities and the natural and social sciences. It also serves as a base for the majors listed below.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
FL	Foreign Language* .5	FL	Foreign Language* .5	FL	Foreign Language* .5
	Group Req. I 3-5		Group Req. I 3-5		Group Req. I 3-5
EH 101	English Comp. .3	EH 102	English Comp. .3	EH 103	English Comp. .3
HY 101	World History .3	HY 102	World History .3	HY 103	World History .3
ROTC	or Elective 1	ROTC	or Elective 1	ROTC	or Elective 1
PE	Physical Education 1	PE	Physical Education 1	PE	Physical Education 1

SOPHOMORE YEAR

PO 209	American Govt. .5	PO 210	State & Local Govt. .5	SY 201	Intr. Sociology .5
	Group Req. II 3-5		Group Req. II 3-5		Group Req. II 3-5
	Group Req. III 5		Group Req. III 5		Group Req. IV 3-5
EH	Literature** .3	EH	Literature** .3	EH	Literature** .3
ROTC	or elective 1	ROTC	or elective 1	ROTC	or elective 1

*A foreign language through the first intermediate course as a minimum. (See page 281.)

**EH 253-254-255 or EH 260-261-262.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student is to complete his major requirements of at least 35 hours, two minors of at least 15 hours each (or a double minor of at least 30 hours), and elective work to total 201 hours. All major and minor courses are to be numbered 200 or above.

Total — 201 quarter hours

GROUP REQUISITE I. The student should take:

- (1) mathematics courses which are requisites to his *major* program; or
- (2) MH 159-161, or MH 160-161, or
- (3) one mathematics course (MH 100, MH 159, MH 160, or MH 161), *plus* one natural science course, or
- (4) one mathematics course (MH 100, MH 159, MH 160, MH 161) *or* one natural science course, *plus* two philosophy courses (PA 202, PA 210, PA 211, PA 212, PA 214, PA 216).

GROUP REQUISITE II. This three-course group allows the student to do one or more of the following:

- (1) take courses which are prerequisites to his major;
- (2) take FED courses which are required in the dual objectives program;
- (3) take 200 level or 300 level courses to satisfy requirements in a declared major or a tentative major, or minor.

GROUP REQUISITE III. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, BI 101-103, BI 101-104, CH 101-102-104, CH 103-104, GL 101-102, PS 205-206, or PS 220-221-222.

GROUP REQUISITE IV. A course (3-5 hours) in music, theatre, art, speech communication, or journalism.

Majors and Minors in the General Curriculum

A student undecided about a major may delay declaring one until the end of his fifth quarter. Before a major is declared, his curriculum will be identified by the symbol GC (General Curriculum). As soon as he is reasonably certain, however, he should declare his major from the following, and identify it by the appropriate departmental symbol. (See page 103.)

BACHELOR OF ARTS: Art, English, Foreign Language, History, Journalism, Philosophy, Political Science, Psychology, Sociology, and Speech Communication.

BACHELOR OF SCIENCE: Biology, Chemistry, Economics, Geography, Geology, Mathematics, and Physics.

Since some of the above majors require alignment of courses beginning in the freshman and sophomore years, it is important that the student be alert early in his college career to all of the requirements of his major which appear under Special Requirements for Departmental Majors.

MINORS: Students who choose one of the above majors will select two minors (minimum of 15 hours credit in each) or one double minor (minimum of 30 hours credit) from the following: architecture, art, botany, chemistry, economics, English, foreign language, geography, geology, history, journalism, mathematics, music, philosophy, physical education, physics, political science, psychology, sociology, speech communication, theatre, zoology, and additional approved subjects in the Schools of Agriculture, Business, Education, Engineering, or Home Economics. All major and minor courses must normally be numbered 200 or above. Selected courses at the 100-level are, however, included in art, music, and theatre; for requirements in these fields, the student should see his adviser. A student cannot major and minor in the same field (except in foreign language; see page 104).

East-European and Russian Studies Program

A student enrolled in the General Curriculum and majoring in history (GHY) or political science (GPO) may elect the East-European and Russian Studies Program. Upon completion of the requirements of this program and earning a bachelor's degree, the achievement will be noted in the student's transcript.

The student will be advised in the program by the Chairman of the Committee on East-European/Russian and Asian Studies as well as by his departmental adviser, and the committee chairman should be notified by the student of his intention of entering the program. The requirements follow:

HISTORY MAJOR. The major will total 35 hours and will include:

HY 201 United States to 1865
HY 202 United States Since 1865

HY 456 Modern Russia, 1453-1917
HY 457 Soviet Union Since 1917

and three courses chosen from:

HY 428 Europe, 1715-1789
HY 429 French Revolution, 1789-1799
HY 435 Napoleonic Europe, 1799-1815

HY 443 Europe, 1815-1871
HY 444 Europe, 1871-1919
HY 445 Europe Since 1919

Two minors will be chosen from philosophy, political science, and the Russian language as prescribed below.

POLITICAL SCIENCE MAJOR. The major will total 35 hours and will include:

PO 423 Communist Theory and Practice
PO 436 Govt. & Politics of Soviet Union

PO 437 Soviet Foreign Policy
PO 438 Govt. & Politics of Eastern Europe

Two minors will be chosen from history, philosophy, and the Russian language as prescribed below.

MINORS. Minors in the East-European and Russian Studies Program include the Russian language, history, philosophy, and political science.

The history minor will include HY 456, HY 457, and one course in European history from those listed above for the history major.

The philosophy minor will include PA 490, Kant; PA 491, German Idealism; and PA 401, Philosophical Foundations of Communism.

The political science minor will include PO 423, PO 436, PO 437, and PO 438.

RUSSIAN LANGUAGE. Each student in the program will complete 15 hours of the Russian language. It is strongly recommended that the student also complete an additional 15 hours in the Russian language and use it as one of his minors.

Special Requirements and Symbols for Departmental Majors

Majors are offered in seven curricula as indicated below. The first letter in each symbol identifies the student's curriculum; the last two letters indicate his major.

Majors	General Curriculum	Pre-Law	Pre-Dentistry	Pre-Medicine	Pre-Optometry	Pre-Hosp. Adm.	Pre-Vet. Med.
Undeclared	GC	PL	PD	PM	OP	HA	PV
Art	GAT						
Biology	GBI	LBI	DBI	MBI	OBI	HBI	
Chemistry	GCH	LCH	DCH	MCH	OCH	HCH	
Economics	GEC	LEC	DEC	MEC	OEC	HEC	VEC
English	GEH	LEH	DEH	MEH	OEH	HEH	VEH
Foreign Language	GFL	LFL	DFL	MFL	OFL	HFL	VFL
Geography	GGY	LGY	DGY	MGY	OGY	HGY	VGY
Geology	GGL	LGL	DGL	MGL	OGL	HGL	
History	GHY	LHY	DHY	MHY	OHY	HHY	VHY
Journalism	GJM	LJM	DJM	MJM	OJM	HJM	VJM
Mathematics	GMH	LMH	DMH	MMH	OMH	HMH	VMH
Philosophy	GPA	LPA	DPA	MPA	OPA	HPA	VPA
Physics	GPS	LPS	DPS	MPS	OPS	HPS	
Political Science	GPO	LPO	DPO	MPO	OPO	HPO	VPO
Psychology	GPG	LPG	DPG	MPG	OPG	HPG	
Sociology	GSY	LSY	DSY	MSY	OSY	HSY	VSY
Speech							
Communication	GSC	LSC	DSC	MSC	OSC	HSC	VSC

Students in these majors should consult with their advisers regularly to plan their major work, clear prerequisites, and take their major courses according to departmental schedule. A minimum of 35 hours is required in each major. All courses must normally be numbered 200 or above.

THE ART MAJOR. The Arts and Sciences student selecting an art major will take AT 105-106-107 and AT 181-182 among his requisites and electives. The *major* will include AT 222, AT 227, AT 305, AT 338, and AT 339, plus 20 additional hours in art courses at the 200 level or above as approved by his adviser. (See also curricula in Fine Arts and Visual Design in the School of Architecture and Fine Arts.)

THE BIOLOGY MAJOR. The Arts and Sciences student selecting a major in biology will take BI 101-102-103, CH 103-104-105 or CH 111-112-113, including

labs, and MH 160-161 among his requisites; and CH 207-208-209 including labs, PS 205-206 among his requisites or on his minors. The *major* will include BY 300, BY 306, BY 406, ZY 300 and ZY 310 plus 10 additional hours to be chosen from the following: BY 309, BY 405, BY 410-411, BY 413-414-415-416, ZY 301, 302-303-304, ZY 306, ZY 308, ZY 401, ZY 409, ZY 411, ZY 420, ZY 421-422, ZY 424, and ZY 450. (See also Special Curriculum in Biology in the School of Agriculture.)

THE CHEMISTRY MAJOR. A chemistry *major* in the General Curriculum will take CH 103-104-105 and labs (or CH 111-112-113), MH 160-161-162 among his requisites; and PS 205-206 (or PS 220-221-222) among his requisites or on a minor. The *major* will include CH 204-205, CH 207-208-209 and labs, plus 10 additional hours of chemistry on the 300-400 level. (See also Special Curriculum in Chemistry.)

THE ECONOMICS MAJOR. An Arts and Sciences student selecting a *major* in economics will take MH 159-161 or MH 160-161 during his freshman year, EC 200, EC 202, and EC 274 during his sophomore year, and IE 205 or MN 207 during his junior or senior year. In addition the *major* will include EC 360, EC 451, EC 454, and EC 456, plus 15 additional hours to be chosen from the following: EC 350, EC 402, EC 444, EC 445, EC 446, EC 452, EC 453, EC 455, EC 457, EC 458, EC 459, EC 460, EC 462, EC 464, EC 465, EC 471, EC 474, EC 475, EC 485, AS 460. (See also Curriculum in Economics in the School of Business.)

THE ENGLISH MAJOR. The *major* will take EH 253-254-255, twenty hours of foreign language preferably in one language, and five hours of history (English or European). In addition, the student should work out a balanced program with his English faculty adviser. This program should include: (a) EH 390, EH 401, or EH 441; (b) three courses selected from different periods, each of the three emphasizing a different type of literature (i.e. fiction, poetry, drama); (c) three survey or period courses dealing with the literature of different ages.

THE FOREIGN LANGUAGE MAJOR. A *major* will consist of 35 hours in one language at a level higher than the initial three quarters (15 hours) offered by the Department of Foreign Languages. A *minor* will consist of 15 hours in one language at a level higher than the initial three quarters (15 hours). A student may *major* in one foreign language and *minor* in one other. In no instance may more than 80 hours of foreign languages be used toward a bachelor's degree. For advanced placement, see page 20.

THE GEOGRAPHY MAJOR. An Arts and Sciences student selecting a *major* in geography will take GY 102 and GY 203 during his sophomore year and, in addition, a minimum of 35 hours in geography courses including GY 201, GY 305, GY 330, GY 400, and GY 405. (See also Curriculum in Geography in the School of Business.)

THE GEOLOGY MAJOR. A *major* in geology will take (1) a minimum of 35 hours in geology courses numbered at the 200-level or above, (2) mathematics through MH 163, and (3) a minimum of one year each in two of the following: (a) biological sciences, (b) chemistry, or (c) physics (students selecting the sequence PS 220-221-222 should also take MH 264). Minor sequences, where applicable, should be chosen with the advice and consent of the departmental adviser so as to strengthen the student's major field and/or area of

intended specialization in employment after graduation. (See also Special Curriculum in Geology.)

THE HISTORY MAJOR. Prerequisites are HY 101-102-103. In addition, the *major* must include HY 201-202 and at least 25 hours of history courses numbered at the 300-level or above. The student should consult the History Department each quarter of his junior and senior years regarding completion of his major and minor fields.

THE JOURNALISM MAJOR. Thirty-six hours of course work in journalism are required for the *major*. JM 221, JM 223, JM 224, JM 322 and JM 421 must be taken by all majors. The additional 11 hours must include either JM 323 or JM 465 plus JM 422, JM 423 (Journalism Workshop, six hrs.), or JM 425 (Journalism Internship, six hrs.). Students majoring or minoring in journalism should consult the journalism faculty about their programs of study. JM 221 should be scheduled during the sophomore year.

THE MATHEMATICS MAJOR. A mathematics *major* in the General Curriculum should take MH 160 or MH 161, as appropriate, during his first quarter and complete the freshman calculus sequence MH 161-162-163 as early in his program as possible. He then will meet his major requirements by following one of two plans. **Plan I** is oriented toward theoretical mathematics and under it a student must take the courses MH 264, MH 265, MH 266, MH 331-332, MH 420-421, plus two additional approved upper-division mathematics courses. This plan may be used to prepare for graduate study in mathematics. Under **Plan II** a student must take MH 264, MH 265, MH 266, MH 331, MH 418, MH 420, MH 460, MH 467, plus one additional approved upper-division course. This program provides appropriate preparation in mathematics for a computer-related career. A suitable minor may be based on courses taught in the School of Engineering. A mathematics *minor* may not include courses numbered in the 280's or 480's. (See also Special Curriculum in Mathematics.)

THE PHILOSOPHY MAJOR. A *major* will take PA 210 and 211 during his freshman or sophomore year. In addition he will include 35 hours in philosophy courses, at least 10 hours of which must be chosen from 300-level courses and 15 hours of which must be from 400-level courses. Majors should consult the department concerning specific courses, minor areas, and electives. The student wishing to major in philosophy must have his program specifically approved by his departmental adviser.

THE PHYSICS MAJOR. A physics major in the General Curriculum will take mathematics through MH 163 in his freshman and sophomore year, and MH 264 among his electives or on a minor. While not required, MH 265 and MH 266 are recommended during his junior year. Ten hours in another natural science (with laboratory) must be completed. The *major* will include PS 205-206, and PS 210 (or PS 220-221-222, and PS 320), PS 217, PS 300, PS 301 or PS 302, PS 303 or PS 304, and PS 305. Students electing a *minor* in physics will take PS 205, PS 206, and PS 210, (or PS 220, PS 221, PS 222, and PS 320). (See also Special Curricula in Physics and Applied Physics.)

THE POLITICAL SCIENCE MAJOR. The *major* will consist of 35 hours of political science beyond the 200 level of which at least 10 hours must be at the 400 level.

THE PSYCHOLOGY MAJOR. A *major* will take 36 hours of psychology which will include PG 211-212, PG 215, at least nine hours of experimental psy-

chology, and 16 hours of psychology courses at the 400 level. In addition he must complete MH 161 and preferably MH 162, as well as VM 220-221 or other science requisites approved by his adviser.

THE SOCIOLOGY MAJOR. A *major* will consist of a minimum of 40 hours of sociology courses following SY 201. These courses must include SY 202 or SY 370, SY 203, SY 220, and SY 309 or SY 402. In the selection of the remaining sociology courses to complete the major, the student is encouraged to consult with faculty advisers in the Department so as to take those courses most helpful for the attainment of the student's particular objectives.

THE SPEECH COMMUNICATION MAJOR. The areas of speech communication are (a) fundamentals, (b) public address, (c) interpretation, (d) mass communication, (e) speech pathology and audiology, and (f) group communication. A student may elect to pursue a general course of study by taking SC 200, SC 201, SC 202 and 25 additional hours with at least one course in the areas of c, d, e, and f; or he may emphasize speech pathology and audiology by taking SC 200, SC 201, SC 202 and 25 additional hours primarily in area e; or he may emphasize mass communication by taking SC 200, SC 201, SC 202, SC 230, SC 235, SC 234 or SC 338, SC 436 or SC 438 or SC 439, and five hours in area c or f.

Pre-Professional Curricula

Pre-professional programs are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-hospital administration, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine.

Curriculum in Pre-Law (PL)

The pre-law curriculum is designed to prepare students for accredited professional law schools, most of which require for admission a bachelor's degree, a good scholastic record, and a good score on the national Law School Admission Test. The pre-law student should take the LSAT at least nine months ahead of the date when he expects to enter law school.

A pre-law student who is able to gain admission into an accredited law school short of a degree may obtain a combination bachelor's degree by completing the first three years of this curriculum (including the special requirements listed below) and the freshman year of law school.

FRESHMAN AND SOPHOMORE YEARS

The student will follow the General Curriculum and will take EC 200 as one course in Group Requisite II.

JUNIOR AND SENIOR YEARS

During the junior and senior years, the pre-law student should complete his major requirements of at least 35 hours, two minors of at least 15 hours each, or a double minor of at least 30 hours, and additional work to total 201 hours. He should take EC 202, ACF 215, EH 390, HY 306, HY 471, PO 401 or PO 402, and SC 202 or SC 311 in his major, minor, requisites, or electives. Recommended in addition to these are SC 278 and an additional course in political science.

Total — 201 quarter hours

Major in the Pre-Law Curriculum

The *Pre-Law Adviser* will guide the student concerning law school admission requirements, and the department in which the student majors will advise him in his major work. Majors are:

BACHELOR OF ARTS: English, Foreign Language, History, Journalism, Philosophy, Political Science, Psychology, Sociology, and Speech Communication.

BACHELOR OF SCIENCE: Biology, Chemistry, Economics, Geography, Geology, Mathematics, and Physics.

Upon selection of a major, a student should check over all of its requirements and utilize Group Requisites I, II, III, and IV as much as possible to clear lower level requisites during his freshman and sophomore years. (See Special Requirements and Symbols for Departmental Majors on page 103.)

Curriculum in Pre-Dentistry (PD), Pre-Medicine (PM), and Pre-Optometry (OP)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for the rigorous demands of American medical, dental, and optometry schools. The requirements are very exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a professional school.

The bachelor's degree is required by most dental and medical schools for admission; however, should an outstanding student gain admission to a dental or medical school prior to graduation, he may receive a combination B.S. degree by completing successfully the first nine quarters of this curriculum, including the special requirements listed as (a) under the junior and senior years below, a total of 157 quarter hours, and the freshman year of professional school.

Students with outstanding records who are able to gain admission to an accredited school of optometry before graduation may qualify for the combination B. S. degree by one of the following methods: (1) completing successfully the first nine quarters of this curriculum including the special requirements listed as (a) under junior and senior years below, a total of 157 quarter hours, plus the freshman year of professional optometry school; or (2) completing successfully the first two years of this curriculum, a total of 111 quarter hours, plus three years of professional optometry school.

The *Predental-Premedical Advisory Committee* will guide the student concerning professional school admission requirements, but the department in which the student majors will guide him in his major work. A student in pre-dentistry or pre-medicine should take the national Dental Aptitude Test or the Medical College Admission Test at least a year in advance of the date he plans to enter professional school, and follow with an application to the professional school of his choice. The student should seek information from the Predental-Premedical Advisory Committee concerning procedures he must follow to obtain the necessary committee evaluation and recommendation to the professional school to which he seeks admission early in his junior year. Forms and instructions are available in the office of the Dean of Arts and Sciences.

The Pre-Optometry student should write for an official bulletin from each of the professional schools of his choice during his freshman year, and discuss with the *Pre-Optometry Adviser* any special requirements of those particular schools. He should make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
CH 111	General Chemistry — 5	CH 112	General Chemistry — 5	CH 113	General Chemistry — 5
MH 161	An. Geom. & Cal. — 5	MH 162	An. Geom. & Cal. — 5	MH 163	An. Geom. & Cal. — 5
EH 101	English Comp. — 3	EH 102	English Comp. — 3	EH 103	English Comp. — 3
HY 101	World History — 3	HY 102	World History — 3	HY 103	World History — 3
ROTC	or elective — 1	ROTC	or elective — 1	ROTC	or elective — 1
PE	Physical Education — 1	PE	Physical Education — 1	PE	Physical Education — 1

SOPHOMORE YEAR

BI 101	Prins. Biol. & Lab. — 5	BI 102	Plant Biology & Lab. 5	BI 103	Animal Biol. & Lab. 5
CH 207	Organic Chem. & Lab. — 5	CH 208	Organic Chem. & Lab. — 5	CH 209	Organic Chemistry — 5
PS 205	Intr. Physics — 5	PS 206	Intr. Physics — 5	PS 210	Modern Physics — 5
EH	Literature* — 3	EH	Literature* — 3	EH	Literature* — 3
ROTC	or elective — 1	ROTC	or elective — 1	ROTC	or elective — 1

*EH 253-254-255 or EH 260-261-262.

During the junior and senior years the student will complete the following special requirements: (a) CH 204 and Lab, CH 407, CH 408, EH 390, PG 211, PG 212, PO 209, PO 401 or PO 402, SY 201, ZY 300, ZY 302, one 200-level philosophy course, and (b) the requirements of his major to be selected from those listed under Special Requirements and Symbols for Departmental Majors on page 103. Other recommended courses are BY 300, EC 200, EC 202, FL through the elementary level as a minimum (see page 281), GL 101, GL 102, HY 306, IE 204, MH 264, MH 265, PG 330, SC 311, SY 202, SY 203, SY 207, ZY 301, ZY 310, ZY 420, ZY 424, and/or 300-400 level courses in English, history, philosophy, political science, and sociology.

Total — 209 quarter hours

A student should become acquainted with the special requirements for his major (see page 101) to begin as early as possible the alignment of courses required in his major.

Curriculum in Pre-Hospital and Health Services Administration (HA)

This curriculum, leading to a Bachelor of Science degree, is designed to prepare students for admission to graduate schools of health services administration which include such diverse fields as hospital administration, health planning, rehabilitation, nursing homes, governmental health services, mental retardation, mental health, and health association work. Opportunities for graduate training are available in some of these areas through the Ph.D. level, especially for students interested in careers in research and teaching.

The student should strive for a college record of B or higher to attain reasonable promise of being admitted to a graduate program in the professional school of his choice.

The *Pre-Hospital and Health Services Administration Adviser* will guide the student in curriculum matters and admission requirements to professional

schools of hospital administration, but the department in which he majors will guide him in his major work. The student should write for an official bulletin from each of the professional schools of his choice or from the Association of University Programs in Hospital Administration during his freshman year or as soon thereafter as possible and discuss with his adviser any special requirements of those particular schools. He should take the appropriate Graduate Record Examination and make application for admission to the professional schools of his choice about a year in advance of the expected date of matriculation.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
BI 101	Prins. Biol. & Lab. — 3	BI 104	Biol. Human Affairs — 5	PA	Group Req. I — 3-5
MH 160	Pre-Cal. w. Trig. — 5	MH 161	An. Geom. & Cal. — 5	PO 209	American Gov't. — 5
EH 101	English Comp. — 3	EH 102	English Comp. — 3	EH 103	English Comp. — 3
HY 101	World History — 3	HY 102	World History — 3	HY 103	World History — 3
ROTC	or elective — 1	ROTC	or elective — 1	ROTC	or elective — 1
PE	Physical Education — 1	PE	Physical Education — 1	PE	Physical Education — 1

SOPHOMORE YEAR

EC 200	Economics I — 5	EC 202	Economics II — 5	EC 274	Bus. & Econ. Stat. — 5
ACF 211	Prins. of Accounting — 5	ACF 212	Prins. of Accounting — 5	SY 201	Intr. to Sociology — 5
EH	Group Req. II — 3-5	PG 211	Psychology — 5	PG 212	Psychology — 3
EH	Literature* — 3	EH	Literature* — 3	EH	Literature* — 3
ROTC	or elective — 1	ROTC	or Elective — 1	ROTC	or Elective — 1

*EH 253-254-255 or EH 260-261-262.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following special requirements: (a) MN 310, MN 341, MN 346, PO 325, PO 401 or PO 402, SY 418, and (b) the requirements of his major to be selected from those listed under Special Requirements and Symbols for Departmental Majors on page 103. Other recommended courses are ACF 310, ACF 311, ACF 312, ACF 320, ACF 410, EC 350, EC 360, EC 444, EC 445, EC 451, EC 454, EC 456, EC 460, EC 462, EC 465, EC 485, EH 141, EH 357, EH 358, FL through the elementary level as a minimum (see page 281), IE 201, MN 207, MN 342, MN 440, MN 442, MN 449, MN 481, MN 482, MT 331, MT 435, MT 436, PA 202, PA 210, PA 211, PA 212, PA 214, PA 216, PA 370, PA 415, PA 417, PG 330, PG 461, PO 210, PO 331, PO 402, SY 202, SY 203, SY 204, SY 304, SY 309, SY 310, SY 311, SY 401, SY 402, SY 404, SY 405, PO 323, SY 408, VM 220, and VM 221 are highly recommended.

Total — 203 quarter hours

GROUP REQUISITES

GROUP REQUISITE I. A 200-level philosophy course.

GROUP REQUISITE II. EH 345 or EH 390 or SC 311.

A student should become acquainted with the special requirements for his major (see page 101) to begin as early as possible the alignment of courses required in his major.

Curriculum in Pre-Occupational Therapy (OT)

This curriculum is designed to prepare students for admission to professional schools of occupational therapy. The student should strive for a good college record to attain reasonable promise of being selected by the professional school of his choice.

The *Pre-Occupational Therapy Adviser* will guide students in curriculum matters and professional school admission requirements. The student should write for official bulletins from the professional schools of his choice early in his freshman year and discuss with his Adviser any special requirements of those particular schools. He should make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

FRESHMAN YEAR

First Quarter

BI 101	Prins. Biol. & Lab.	5
MH 160	Pre-Cal. w. Trig.	5
EH 101	English Comp.	3
HY 101	World History	3
ROTC*	or Elective	1
PE	Physical Education	1

Second Quarter

BI 103	Animal Biology	
	& Lab.	5
	Group Req. I	5
EH 102	English Comp.	3
HY 102	World History	3
ROTC*	or Elective	1
PE	Physical Education	1

Third Quarter

	Group Req. II	5
	Group Req. III	3-5
EH 103	English Comp.	3
HY 103	World History	3
ROTC*	or Elective	1
PE	Physical Education	1

SOPHOMORE YEAR

PG 211	Psychology	5
SY 201	Intr. Sociology	5
	Group Req. IV	3-5
EH	Literature**	3
ROTC*	or Elective	1

PG 212	Psychology	3
	Group Req. V	3-5
FCD 307	Growth and Devel.	
	of Children	5
EH	Literature**	3
ROTC*	or Elective	1

PG 330	Social Psychology	4
	Group Req. VI	3-5
	Group Req. VII	3
EH	Literature**	3
ROTC*	or Elective	1

*Students not taking Basic ROTC will substitute PO 209 and a one-hour elective.

**EH 253-254-255 or EH 260-261-262.

Total — 107 quarter hours

GROUP REQUISITES

GROUP REQUISITE I. AT 105 or AT 181.

GROUP REQUISITE II. BI 102 or VM 220.

GROUP REQUISITE III. A course in art, music, or speech communication.

GROUP REQUISITE IV. A course in physical sciences or logic.

GROUP REQUISITE V. SY 203 or SY 305.

GROUP REQUISITE VI. A course in the behavioral sciences.

GROUP REQUISITE VII. PG 215 or SY 220.

Students who continue beyond the sophomore year should select courses from alternate group requisites listed above, subject to additional specific requirements of the chosen professional schools. Also recommended are one or more 200-level courses in philosophy and other courses in the humanities and social sciences.

Curriculum in Pre-Physical Therapy (PT)

This curriculum is designed to prepare students for admission to professional schools of physical therapy. The student should strive for a good college record to attain reasonable promise of being selected by the professional school of his choice.

The *Pre-Physical Therapy Adviser* will guide students in curriculum matters and professional school admission requirements. The student should write for official bulletins from the physical therapy schools of his choice early in his freshman year and discuss with his Adviser any special requirements of these particular schools. He should make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
CH 111	General Chemistry .5	CH 112	General Chemistry .5	CH 115	General Chemistry .5
MH 160	Pre-Cal. w. Trig. .5	MH 161	An. Geom. & Cal. I .5		Group Req. I .3-5
EH 101	English Comp. .3	EH 102	English Comp. .3	EH 103	English Comp. .3
HY 101	World History .3	HY 102	World History .3	HY 103	World History .3
ROTC*	or Elective .1	ROTC*	or Elective .1	ROTC*	or Elective .1
PE	Physical Education .1	PE	Physical Education .1	PE	Physical Education .1

SOPHOMORE YEAR

BI 101	Prins. Biol. & Lab. .5	BI 103	Animal Biol. & Lab. .5	PG 212	Psychology .3
	Group Req. I .3-5	PG 211	Psychology .5		Group Req. II .5
PS 205	Intr. Physics .5	PS 206	Intr. Physics .5		Group Req. III .5
EH	Literature** .3	EH	Literature** .3	EH	Literature** .3
ROTC*	or elective .1	ROTC*	or Elective .1	ROTC*	or Elective .1

*Students not taking Basic ROTC will substitute PO 209 and a one-hour elective.
 **EH 253-254-255 or EH 260-261-262.

Total — 107 quarter hours

GROUP REQUISITES

GROUP REQUISITE I. A course in art, music, or philosophy.

GROUP REQUISITE II. MH 267, PG 215, or SY 220.

GROUP REQUISITE III. A course in anthropology or sociology.

Students who continue beyond the sophomore year should select courses in the humanities and social sciences, subject to additional specific requirements of the chosen professional schools. Especially recommended are FL through the elementary level as a minimum (see page 281), PO 210, SY 201, SY 203 and/or a 200-level course in philosophy.

Curriculum in Pre-Pharmacy (PPY)

The curriculum in pre-pharmacy is designed to meet the requirements for admission to the Auburn University School of Pharmacy, which is fully accredited by the American Council on Pharmaceutical Education. Complete information about the professional curriculum in pharmacy may be found on page 197.

To gain admission to the professional curriculum, a student must complete the basic two-year requirements below with a 1.00 (C) average or better and receive approval of his application for admission by the Admissions Committee of the School of Pharmacy. A student who does not qualify for admission to the School of Pharmacy after completion of eight quarters in pre-pharmacy at Auburn University but who meets University continuation in residence requirements may continue to register in pre-pharmacy only by special permission of the Deans of Pharmacy and Arts and Sciences.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
CH 103	Fund. Chem. & Lab. .5	CH 104	Fund. Chem. & Lab. .5	BI 101	Prins. Biol. & Lab. .5
MH 160	Pre-Cal. w. Trig. .5	MH 161	An. Geom. & Cal. I .5	CH 105	Fund. Chem. & Lab. .5
EH 101	English Comp. .3	EH 102	English Comp. .3	EH 103	English Comp. .3
HY 101	World History .3	HY 102	World History .3	HY 103	World History .3
ROTC*	or elective .1	ROTC*	or elective .1	ROTC*	or elective .1
PE	Physical Education .1	PE	Physical Education .1	PE	Physical Education .1

SOPHOMORE YEAR

BI 102	Plant Biol. & Lab. .5	BI 103	Animal Biol. & Lab. .5	CH 204	An. Chem. & Lab. .5
CH 207	Organic Chem. & Lab. .5	CH 208	Organic Chem. & Lab. .5	PS 206	Intr. Physics .5
	Group Req. I .3-5	PS 205	Intr. Physics .5		Group Req. II .3-5
PPY 101	Pharm. Orient. .2		Group Req. I .3-5		Group Req. III .3-5
ROTC*	or Elective .1	ROTC*	or Elective .1	ROTC*	or Elective .1

Total — 108 quarter hours

GROUP REQUISITES

The order in which three and five-hour group requisites are scheduled may be interchanged; these four courses are to be selected from the subjects in Groups I, II, and III listed below.

GROUP REQUISITE I. A minimum of six hours of humanities and fine arts (including one or more courses of literature) to be selected from the following: AR 360, AT 338, EH 253-254 or EH 260-261, EH 340, FI. through the elementary level as a minimum (see page 281), MU 373, MU 374.

GROUP REQUISITE II. A minimum of three hours of philosophy to be selected from the following: PA 202, PA 210, PA 211, PA 212, PA 214, PA 216, PA 330.

GROUP REQUISITE III. A minimum of three hours in the behavioral and social sciences to be selected from the following: PG 211, PO 209, PO 309, SY 201, SY 311.

Curriculum in Pre-Veterinary Medicine (PV)

The pre-veterinary medicine curriculum at Auburn is open only to students who are bona fide residents of the State of Alabama under the Regional Plan of the Southern Regional Education Board. *Minimum* requirements for admission to the School of Veterinary Medicine are the *first seven quarters* as listed below (123 quarter hours).

The student will be guided by the *Pre-Veterinary Medicine Advisers* regarding preparation for admission to the School of Veterinary Medicine. Should he declare a major, he will be advised by the department in which he majors.

Applications for admission to the School of Veterinary Medicine must be submitted to the Dean of that school by February 15 preceding the admission date. A minimum grade point average of 1.25 is required for admission; D grades in required academic courses are not acceptable. All course requirements must be completed by the end of the spring quarter preceding the date of admission. (For further information, see School Veterinary Medicine on page 198.)

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
CH 103 Fund. Chem. & Lab. 5	CH 104 Fund. Chem. & Lab. 5	BI 101 Prins. Biol. & Lab. 5
MH 160 Pre-Cal. w. Trig. 5	MH 161 An. Geom. & Cal. 1.5	CH 105 Fund. Chem. & Lab. 5
EH 101 English Comp. 3	EH 102 English Comp. 3	EH 103 English Comp. 3
HY 101 World History 3	HY 102 World History 3	HY 103 World History 3
ROTC or elective 1	ROTC or elective 1	ROTC or elective 1
PE Physical Education 1	PE Physical Education 1	PE Physical Education 1

SOPHOMORE YEAR

BI 103 Animal Biol. & Lab. 5	ADS 204 Anim. Biochem. & Nut. 5	PO 209 American Govt. 5
CH 207 Organic Chem. & Lab. 5	EH 141 Medical Vocabulary 3	Group Req. I 3-5
PS 205 Intr. Physics 5	CH 208 Organic Chem. & Lab. 5	Group Req. I 5
ROTC or elective 1	PS 206 Intr. Physics 5	ROTC or elective 1
	ROTC or elective 1	

JUNIOR YEAR

ZY 300 Genetics 5	CH 204 An. Chem. I & Lab. 5	CH 316 Phys. Chem. & Lab. 5
Group Req. I* 5	FL II Foreign Language 5	FL III Foreign Language 5
ADS 302 Feed and Feeding 3	PS 210 Modern Physics 5	Group Req. II 3-5
BY 300 Gen. Microbiology 5	Group Requisite III 3	Group Req. III 3

GROUP REQUISITES

GROUP REQUISITE I. These requisites must be earned in humanities and fine arts, and the social sciences to meet the Liberal Education requirements of the University.

GROUP REQUISITE II. ADS 200, AS 361, CH 204, CH 205, CH 209, CH 316, EC 200, MN 341, MN 342, EH 253-254-255 or EH 260-261-262, EH 350, EH 357, EH 358, EH 390, FL (see Degree Options below and page 281), HY 201, HY 202, MH 163, MH 264, PA 202, PA 210, PA 211, PA 212, PH 301, PG 211, PG 212, PO 210 or PO 309 or PO 325, PS 210, SC 202, SY 201, SY 203, ZY 404.

GROUP REQUISITE III. These requisites are to be chosen from courses offered by the following departments: AR, BY, TH, EC, EH, GY, HY, MU, PA, PG, PS, SC, SY, and ZY. EED 310 may also be taken.

***DEGREE OPTIONS.** Students in PV may obtain a Bachelor of Science degree by completing the first nine quarters of this curriculum, including foreign language through the first intermediate course, *plus* (1) successfully completing the freshman year of the School of Veterinary Medicine, or (2) forty hours of Group Requisite II and nine hours of Group Requisite III, or (3) completing the requirements for a major to be selected from those listed under Special Requirements and Symbols for Departmental Majors on page 103. Options (2) and (3) must add up to a total of 201 quarter hours.

Special Curricula

Special curricula leading to the Bachelor of Science degree include chemistry, chemistry with biochemistry option, geology, laboratory technology, law enforcement, mathematics, physics, applied physics, and public administration.

Curriculum in Chemistry (CH)

The curriculum in chemistry meets the standards of the accrediting committee of the American Chemical Society. It prepares and trains students desiring careers in both pure and applied chemistry.

Training is offered in the fundamentals of the science, together with advanced courses in chemistry and physics. Electives should be chosen for their cultural value, and must be approved by the department head.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
CH 111 General Chemistry	—5	CH 112 General Chemistry	—5	CH 113 General Chemistry	—5
MH 161 An. Geom. & Cal.*	—5	MH 162 An. Geom. & Cal.	—5	MH 163 An. Geom. & Cal.	—5
EH 101 English Comp.	—3	EH 102 English Comp.	—3	EH 103 English Comp.	—3
HY 101 World History	—3	HY 102 World History	—3	HY 103 World History	—3
ROTC or elective	—1	ROTC or elective	—1	ROTC or elective	—1

SOPHOMORE YEAR

CH 204 An. Chem. & Lab.	—5	CH 205 An. Chem. & Lab.	—5	CH 303 Organic Chemistry	—5
MH 264 An. Geom. & Cal. IV	—5	PS 221 Gen. Physics II	—4	PS 222 Gen. Physics III	—4
PS 220 Gen. Physics I	—4	MH 265 Lin. Diff. Equations	—3	MH 266 Topics Lin. Algebra	—3
ROTC or elective	—1	Approved elective	—3	Approved elective	—3
PE Physical Education	—1	ROTC or elective	—1	ROTC or elective	—1
		PE Physical Education	—1	PE Physical Education	—1

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
CH 304 Organic Chemistry — 5	CH 305 Organic Chemistry — 5	CH 409 Physical Chemistry — 5
CH 407 Physical Chemistry — 5	CH 408 Physical Chemistry — 5	FL German** — 5
FL German** — 5	FL German** — 5	PS 305 Modern Physics — 5
Approved elect.*** — 3	Approved elect. — 3	Approved elect. — 3

*Students not prepared for MH 161 must take MH 160 without credit.

**German through the first intermediate course. (See page 281.)

***A maximum of six hours of advanced ROTC may be substituted for electives in the junior or senior year. Students will be certified to the American Chemical Society as Certified Graduates when they have made up the electives for which advanced ROTC was substituted.

SENIOR YEAR		
CH 404 Organic Anal. (Qual.) — 5	CH 411 Inter. Inorg. Chem. — 5	CH 413 Anal. Chemistry — 5
CH 410 Inter. Inorg. Chem. — 5	CH 412 Chem. Thermodynamics — 5	Elective — 3-5
Group Requisite — 5	Elective — 3-5	Elective — 3-5
Elective — 3	Elective — 3	Elective — 3

Total — 205 quarter hours

GROUP REQUISITE. EC 200, PO 209, or SY 201.

APPROVED ELECTIVES		
EH 253-254-255 or EH 260-261-262 — 3-3-3	PO 209 American Government — 5	
EH 350 Shakespeare's Greatest Plays — 3	EC 200 General Economics — 5	
EH 365 Southern Literature — 3	EC 206 Socio-Economic Foundations of Contemporary America — 3	
TH 313 Theatre Appreciation I — 3	GY 303 Geography of the Soviet Union — 3	
MU 373 Appreciation of Music — 3	SY 201 Introduction to Sociology — 5	
MU 374 Masterpieces of Music — 3	PG 211 Psychology — 5	
HY 201 History of U.S. — 5		
HY 202 History of U.S. — 5		

Alternate Curriculum in Chemistry (CH) (Biochemistry Option)

FRESHMAN YEAR		
First Quarter	Second Quarter	Third Quarter
CH 111 General Chemistry — 5	CH 112 General Chemistry — 5	CH 113 General Chemistry — 5
MH 161 An. Geom. & Cal.* — 5	MH 162 An. Geom. & Cal. — 5	MH 163 An. Geom. & Cal. — 5
EH 101 English Comp. — 3	EH 102 English Comp. — 3	EH 103 English Comp. — 3
HY 101 World History — 3	HY 102 World History — 3	HY 103 World History — 3
ROTC or elective — 1	ROTC or elective — 1	ROTC or elective — 1
PE Physical Education — 1	PE Physical Education — 1	PE Physical Education — 1
SOPHOMORE YEAR		
CH 204 An. Chem. & Lab. — 5	CH 205 An. Chem. & Lab. — 5	BI 101 Prins. of Biol. & Lab. — 5
MH 264 An. Geom. & Cal. — 5	PS 221 Gen. Physics II — 4	CH 303 Organic Chemistry — 5
PS 220 Gen. Physics I — 4	MH 265 Lin. Diff. Equations — 3	PS 222 Gen. Physics III — 4
ROTC or elective — 1	Elective — 3	ROTC or elective — 1
ROTC or elective — 1	ROTC or elective — 1	ROTC or elective — 1
JUNIOR YEAR		
BI 103 Animal Biol. & Lab. — 5	CH 305 Organic Chemistry — 5	CH 409 Physical Chemistry — 5
CH 304 Organic Chemistry — 5	CH 408 Physical Chemistry — 5	BY 300 Gen. Microbiology — 5
CH 407 Physical Chemistry — 5	ZY 301 Compar. Anatomy — 5	ZY 424 Animal Physiology — 5
Approved elect. — 3	Approved elect. — 3	Approved elect. — 3
SENIOR YEAR		
CH 418 Biochemistry — 5	CH 419 Biochemistry — 5	CH 420 Biochemistry — 5
FL German** — 5	FL German** — 5	FL German** — 5
EH 390 Adv. Composition — 5	Group Requisite — 3-5	Approved elect. — 3-5
Approved elect. — 3	Approved elect. — 3	Approved elect. — 3

*Students not prepared for MH 161 must take 160 without credit.

**German through the first intermediate course. (See page 287.)

Total — 204 quarter hours

GROUP REQUISITE. EC 200, PO 209, or SY 201.

APPROVED ELECTIVES

EH 253-254-255 or EH 260-261-262	3-3-3	PO 209 American Government	5
EH 550 Shakespeare's Greatest Plays	3	EC 200 General Economics	5
EH 365 Southern Literature	3	EC 206 Socio-Economic Foundations of Contemporary America	3
TH 313 Theatre Appreciation I	3	GY 303 Geography of the Soviet Union	3
MU 375 Appreciation of Music	3	SY 201 Introduction to Sociology	5
MU 374 Masterpieces of Music	3	PG 211 Psychology	5
HY 201 History of U.S.	5		
HY 202 History of U.S.	5		

Curriculum in Geology (GL)

The science of geology utilizes many concepts of other basic sciences in order to provide a basis for systematic study of the planet Earth. Today, more than ever before, the average citizen is aware of the role of geology and the geologist in almost every aspect of everyday life.

The undergraduate special curriculum in geology prepares the student broadly in all aspects of geological processes and principles. This should enable him to make a more intelligent selection of a graduate program of study that will permit specialization in one or more of the many aspects of the science — economic geology, geophysics, geochemistry, petrology, paleontology, ground water geology, or environmental geology, as well as other special fields from astrogeology to oceanography. Employment for the geologist ranges from federal and state service through university or college and industrial programs to private consulting.

The following four-year program satisfies the requirements for graduation with a Bachelor of Science degree in geology. (See also geology major and minor under Special Requirements and Symbols for Departmental Majors.)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
GL 101 Intr. Geology I	5	GL 102 Intr. Geology II	5	MH 163 An. Geom. & Cal.	5
MH 161 An. Geom. & Cal.	5	MH 162 An. Geom. & Cal.	5	EH 103 English Comp.	3
EH 101 English Comp.	3	EH 102 English Comp.	3	HY 103 World History	3
HY 101 World History	3	HY 102 World History	3	Elective	3-5
ROTC or elective	1	ROTC or elective	1	ROTC or elective	1
PE Physical Education	1	PE Physical Education	1	PE Physical Education	1

SOPHOMORE YEAR

CH Chemistry*	5	BI 101 Biology	5	BI 102 or 103 Biology	5
MH 264 An. Geom. & Cal.	5	CH Chemistry*	5	CH Chemistry*	5
PO 209 American Gov't.	5	EH Literature**	3	PO 210 State Gov't.	5
EH Literature**	3	GL 201 Geol. Field Methods	2	EH Literature**	3
ROTC or elective	1	ROTC or elective	1	ROTC or elective	1

JUNIOR YEAR

GL 301 Mineralogy I	5	GL 302 Mineralogy II	5	GL 312 Paleobotany	5
GL 310 History of Life	5	GL 311 Paleozoology	5	PS Physics***	4-5
PS Physics***	4-5	PS Physics***	4-5	Minor I	5
Group Requisite	3-5	Elective	3-5	Elective	3-5

SENIOR YEAR

GL 401 Sed.-Sed. Pet.	5	GL 402 Str. Geol. Prins.	5	GL 403 Ign. & Met-Pet.	5
Minor I	5	Minor I	5	GL 411 Stratigraphy	5
Minor II	5	Minor II	5	Minor II	5

*Preferably CH 111-112-113, but another 15-hour sequence of general chemistry (including labs) may be substituted with approval of departmental adviser.

**EH 253-254-255 or EH 260-261-262.

***The 12-hour sequence PS 220-221-222, but a 15-hour physics sequence may be substituted with approval of departmental adviser.

Total — 202 quarter hours

GROUP REQUISITES AND MINORS

GROUP REQUISITES. A course in music, theatre, art, speech communication, or journalism.

MINORS. Two 15-hour minors (or one 30-hour double minor) should be selected from those listed under the General Curriculum with the advice and approval of the student's departmental adviser.

Curriculum in Laboratory Technology (LT)

This curriculum, leading to the degree of Bachelor of Science in Laboratory Technology, is designed for men and women who wish to prepare for clinical and other laboratory positions in such fields as public health and bacteriology. Most of the graduates in this curriculum enter the field of clinical medicine as medical technologists. They should plan to attain status as Registered Medical Technologists which is accomplished by interning for one year in an approved hospital and then passing the National Registry of Medical Technologists written examination.

The *Medical Technology option* leads to the Bachelor of Science degree in Medical Technology (conferred by Auburn University). Degree requirements include successful completion of nine quarters of the laboratory technology curriculum, one year's satisfactory internship in a hospital approved by the American Society of Clinical Pathologists and by the Head of the Chemistry Department of Auburn University, and successful completion of the examination by the National Registry of Medical Technologists. Through completion of this examination, the candidate attains the status of Registered Medical Technologist.

Further requirements include: (1) Auburn University students transferring into medical technology must complete in the laboratory technology curriculum one academic year (54 hours) preceding the year of internship. (2) Transfers from other institutions who choose the medical technology option must complete the second and third years of the laboratory technology curriculum at Auburn prior to internship.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
BI 101	Prins. of Biol. & Lab. 5	BI 103	Animal Biol. & Lab. . . . 5	CH 113	Gen. Chem. & Lab. . . . 5
CH 111	Gen. Chem. & Lab. . . . 5	CH 112	Gen. Chem. & Lab. . . . 5	MH 161	An. Geom. & Cal. 5
MH 160	Pre-Cal. w. Trig. . . . 5	EH 101	English Comp. 3	EH 102	English Comp. 3
LT 101	Orientation 1	HPR 195	Health Science 3	HY 306	Contemp. Affairs 5
PE	Physical Education . . . 1	PE	Physical Education . . . 1	PE	Physical Education . . . 1

SOPHOMORE YEAR

CH 207	Organic Chem. & Lab. 5	CH 208	Organic Chem. & Lab. 5	BY 300	Gen. Microbiology . . . 5
PS 205	Intr. Physics 5	PS 206	Intr. Physics 5	CH 204	An. Chem. & Lab. . . . 5
EH 103	English Comp. 3	VM 220	Human Anatomy & Physiol. 5	VM 221	Human Anatomy & Physiol. 5
	Elective 3	EH 141	Medical Vocabulary . . 3		

JUNIOR YEAR

CH 418	Biochemistry 5	CH 419	Biochemistry 5	CH 420	Biochemistry 5
LT 301	Hematology 5	LT 404	Immunology I 5	LT 401	Adv. Hematology 5
BY 302	Med. Microbiology . . . 5	ZY 411	Gen. Parasitology 5		Group Requisite 5
HY 101	World History 3	HY 102	World History 3	HY 103	World History 3

SENIOR YEAR

First Quarter

ZY 308	Micrology	5
EH 345	Bus. & Prof. Writing	5
	Approved elect.	5
LT 402	Seminar	3

Second Quarter

PY 428	Public Health	5
SC 202	App. Sp. Comm.	3
	Approved elect.	10

Third Quarter

LT 405	Immunology II	5
LT 422	Hosp. Lab. Practice	5
ZY 409	Histology	5

Total — 205 quarter hours

GROUP REQUISITE. EC 200, PO 209, or SY 201.

APPROVED ELECTIVES

EH 253-254-255 or EH 260-261-262	3-3-3	HY 202	History of U.S.	5	
FL* French or German	5-5	PO 209	American Government	5	
EH 350	Shakespeare's Greatest Plays	3	EC 200	General Economics	5
EH 365	Southern Literature	3	EC 206	Socio-Economic Foundations of Contemporary America	3
TH 313	Theatre Appreciation I	3			
MU 373	Appreciation of Music	3	GY 303	Geography of the Soviet Union	3
MU 374	Masterpieces of Music	3	SY 201	Introduction to Sociology	5
HY 201	History of U.S.	5	PG 211	Psychology	5

*French or German through the elementary level as a minimum. (See page 281.)

Curriculum in Law Enforcement (LE)

The curriculum in law enforcement is designed to prepare students who plan careers in the supervision and administration of law enforcement agencies. Completion of this curriculum leads to the degree of Bachelor of Science.

FRESHMAN YEAR

First Quarter

GY 102	Prins. of Geography	5
	Group Req. I	3-5
EH 101	English Comp.	3
HY 101	World History	3
ROTC	or elective	1
PE	Physical Education	1

Second Quarter

	Group Req. I	5
	Group Req. II	4-5
EH 102	English Comp.	3
HY 102	World History	3
ROTC	or elective	1
PE	Physical Education	1

Third Quarter

	Group Req. I	5
	Group Req. II	4-5
EH 103	English Comp.	3
HY 103	World History	3
PE	Physical Education	1
ROTC	or elective	1

SOPHOMORE YEAR

ACF 211	Intr. Accounting	5
PO 209	American Gov't.	5
EH	Literature*	3
PG 211	Psychology	5
ROTC	or elective	1

ACF 212	Intr. Accounting	5
PO 210	State Gov't.	5
	Group Req. III	3-5
EH	Literature*	3
ROTC	or elective	1

PO 323	Municipal Gov't.	5
SY 201	Intr. Sociology	5
	Group Req. III	3-5
EH	Literature*	3
ROTC	or elective	1

JUNIOR YEAR

EC 200	Economics I	5
PO 325	Public Admin.	5
SY 204	Social Behavior	5
	Group Req. IV	3-5

EH 345	Bus. & Prof. Writing	5
LE 360	Surv. of Law Enf.	5
SY 308	Juvenile Delinq.	5
	Elective	3-5

PG 330	Social Psychology	4
LE 362	Criminal Invest.	5
SY 302	Criminology	5
	Elective	3-5

SENIOR YEAR

PO 401	Const. Law I	5
LE 460	Criminalistics	5
SY 405	Urban Sociology	5

LE 462	Police Adm. and Org.	5
PO 402	Const. Law II	5
	or	
PO 336	Criminal Justice	5
	Elective	3-5
	Elective	3

PO 415	Public Pers. Admin.	3
LE 464	Inter. in Law Enf.	5
	Elective	3-5
	Elective	3

*EH 253-254-255 or EH 260-261-262.

Total — 201 quarter hours

GROUP REQUISITE I. The student should take (1) one mathematics course (MH 100, MH 159, MH 160, MH 161) or one natural science course *plus* two of the following philosophy courses: PA 202, PA 210, PA 211, PA 212, PA 214, PA 216; or (2) MH 159-161 or MH 160-161; or (3) one natural science course *plus* one mathematics course (MH 100, MH 159, MH 160, MH 161).

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, BI 101-103, BI 101-104, CH 101-102-104 or CH 103-104, GL 101-102, PS 205-206, or PS 220-221-222.

GROUP REQUISITE III. The student will choose from the following: CH 101-102-104 or CH 103-104 or CH 111-112-113 (including corresponding laboratories), HY 201, HY 202, MH 162, MH 163, PA 210, PG 212, GY 203, JM 221, SC 202, FL through the elementary level as a minimum (see page 281).

GROUP REQUISITE IV. A course in speech or journalism.

Curriculum in Mathematics (MH)

This curriculum is designed to prepare students for graduate study and eventual careers as mathematicians. The General Curriculum should be used by students who prefer flexibility in the design of their program (see page 100).

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
FL Foreign Language* .5	FL Foreign Language* .5	FL Foreign Language* .5
MH 161 An. Geom. & Cal.** 5	MH 162 An. Geom. & Cal. .5	MH 163 An. Geom. & Cal. .5
EH 101 English Comp. .3	EH 102 English Comp. .3	EH 103 English Comp. .3
HY 101 World History .3	HY 102 World History .3	HY 103 World History .3
ROTC or elective .1	ROTC or elective .1	ROTC or elective .1

SOPHOMORE YEAR

MH 264 An. Geom. & Cal. .5	MH 265 Lin. Diff. Equations .3	MH 351 Intr. Mod. Alg. I .5
Natural Science† .4-5	MH 266 Top. in Lin. Alg. .3	Natural Science .4-5
EH Literature†† .3	EH Natural Science .4-5	EH Literature†† .3
ROTC or elective .1	EH Literature†† .3	ROTC or elective .1
PE Physical Education .1	ROTC or elective .1	PE Physical Education .1
	PE Physical Education .1	

JUNIOR YEAR

FL Foreign Language* .5	FL Foreign Language* .5	FL Foreign Language* .5
MH 332 Intr. Mod. Alg. II .5	MH 333 Intr. Mod. Alg. III .5	MH 421 Analysis II .5
Elective††† .3	MH 420 Analysis I .5	MH Requisite .5-5
Elective .3	Elective .3	Elective .3

SENIOR YEAR

MH 422 Analysis III .5	MH Requisite .5	MH Requisite .5
MH Requisite .3-5	Group Requisite .5	Group Requisite .5
Elective .5	Elective .5	Elective .5
Elective .3	Elective .3	Elective .3

*Completion of two languages, French, German, Russian, through the first intermediate course; or one of these languages through the advanced level. (See page 281.)

**Students not prepared for MH 161 must take MH 160 without credit.

†The natural science requirement may be met by taking PS 220-221-222 or CH 111-112-113. If the 12-hour physics sequence is selected, an additional 3-hour elective will be needed to meet the 196-hour requirement.

††EH 253-254-255 or EH 260-261-262.

†††Appropriate electives to meet the interests of the student may be selected in consultation with his departmental adviser.

Total — 196 quarter hours

GROUP REQUISITES

GROUP REQUISITES. These requisites must be chosen from one of the following areas of social science: economics, education, history, political science, psychology, or sociology.

Curriculum in Physics (PS)

The curriculum in physics has been carefully designed with two objectives. It provides a fundamental preparation for careers in the physical and allied

sciences, and constitutes an excellent foundation for the pursuit of graduate study in physics and related fields.

Because of the integral role played by physics in modern civilization, Auburn physics graduates find rewarding opportunities in such areas as industrial and governmental research and development; chemical, geological, biological, and mathematical physics; medical and dental research; and environmental preservation and control. Many graduates choose to pursue careers in teaching and/or research at the college or university level.

An outstanding feature of the curriculum is the senior research participation wherein investigations of basic experimental problems are undertaken under the supervision of senior staff members. Excellent laboratory and library facilities are available in support of the problems chosen.

Inquisitive students with exceptional abilities in mathematics and physical science and with special aptitudes for research will find the curriculum a challenging inducement to test their competence while striving for high goals of attainment.

FRESHMAN YEAR

First Quarter

CH 103	Fund. Chem. & Lab. I	5
MH 161	An. Geom. & Cal.*	5
EH 101	English Comp.	3
ROTC	or elective	1
PE	Physical Education	1

Second Quarter

CH 104	Fund. Chem. & Lab. II	5
MH 162	An. Geom. & Cal.	5
EH 102	English Comp.	3
HY 101	World History	3
ROTC	or elective	1
PE	Physical Education	1

Third Quarter

MH 163	An. Geom. & Cal.	5
PS 220	Gen. Physics I	4
EH 103	English Comp.	3
HY 102	World History	3
ROTC	or elective	1
PE	Physical Education	1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5
PS 221	Gen. Physics II	4
HY 103	World History	3
PS 217	Astronomy	3
ROTC	or elective	1

FL	German**	5
PS 222	Gen. Physics III	4
MH 265	Lin. Diff. Equations	3
ROTC	or elective	1

FL	German**	5
PS 305	Intr. Mod. Physics	5
MH 266	Topics Lin. Algebra	3
PS 340	Inter. Mechanics	3
ROTC	or elective	1

JUNIOR YEAR

FL	German**	5
PS 300	Inter. Elec. & Mag. I	4
	Elective	5
MH 401	Cal. Vector Funct.	3

MH 406	Elem. Partial D.E.	5
PS 302	Electronics	5
PS 301	Inter. Elec. & Mag. II	4
	Elective	3

PS 303	Optics	5
	Group Requisites	10
	Elective	3

SENIOR YEAR

PS 401	Theor. Physics I	5
PS 415	Mod. Physics I	5
	Electives	8

PS 402	Theor. Physics II	5
PS 416	Mod. Physics II	5
PS 406	Adv. Lab. I	2
	Electives	6

PS 404	Thermodynamics	5
PS 405	or PS 435	5
PS 407	Adv. Lab. II	2
	Electives	6

*Students not prepared for MH 161 must take MH 160 without credit.

**Through the first intermediate course as a minimum. French or Russian may be substituted. (See page 281.)

Total — 207 quarter hours

GROUP REQUISITES

CH 204	Analytical Chemistry I & Lab.†
CH 407	Physical Chemistry
CH 408	Physical Chemistry
GL 301	Mineralogy I
GL 302	Mineralogy II
GL 401	Sedimen.-Sed. Petrology
GL 402	Str. Geol. Prin.
GL 403	Igneous Geology & Petrology
MH 403	Engr. Math. II
MH 405	Matrix Theory & Applications
MH 407	Intr. to Celestial Mech.
MH 460	Numerical Analysis I
PS 304	Applied Spectroscopy

PS 403	Theoretical Physics III
PS 405	Nuclear Physics
PS 408	Advanced Laboratory III
PS 409	Intr. to Reactor Physics I
PS 410	Intr. to Reactor Physics II
PS 412	Seminar in Modern Physics
PS 413	Intr. to X-ray Crystallography
PS 414	Electron Optics & Microscopy
PS 417	Intr. to Biophysics
PS 421	Modern Electronics
PS 425	Prin. Nuclear Energy Systems
PS 435	Intr. to Solid State
PS 470	Health Physics

†Credit for CH 204 allowed only if CH 407 and CH 408 are completed.

Curriculum in Applied Physics (APS)

This curriculum provides a solid foundation in physics and in addition emphasizes several related technical fields to provide a broader base for persons who desire to enter industrial and governmental laboratories following receipt of the undergraduate degree. Individuals wishing to pursue graduate work will find that this curriculum also provides adequate preparation for advanced study.

During the junior and senior years, 20 hours of specialized courses are designated as Group Requisite I. These are to be chosen from one of the following areas: chemistry, geology, aerospace, electrical or mechanical engineering, or nuclear science.

Students anticipating graduate work should complete French, German, or Russian through the first intermediate course, as a part of Group Requisite II. (See page 121.)

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
CH 103 Fund. Chem. & Lab.* 5	CH 104 Fund. Chem. & Lab. 5	MH 163 An. Geom. & Cal. III 5
MH 161 An. Geom. & Cal.** 5	MH 162 An. Geom. & Cal. 5	PS 220 Gen. Physics I 4
EH 101 English Comp. 3	EH 102 English Comp. 3	EH 103 English Comp. 3
ROTC or elective 1	HY 101 World History 3	HY 102 World History 3
PE Physical Education 4	ROTC or elective 1	ROTC or elective 1
	PE Physical Education 1	PE Physical Education 1

SOPHOMORE YEAR

MH 264 An. Geom. & Cal. 5	ME 321 Dyn. of a Particle 4	GL 301 Mineralogy I 5
ME 205 Appl. Mech.-Statics 4	PS 222 Gen. Physics III 4	PS 305 Intr. Mod. Physics 5
PS 221 Gen. Physics II 4	MH 265 Lin. Diff. Equations 3	Group Requisite I 5
HY 103 World History 3	MH 266 Topics Lin. Algebra 3	TS 102 Eng. Drawing 2
TS 113 Tool Lab. 1	Group Requisite II 3	ROTC or elective 1
ROTC or elective 1	ROTC or elective 1	

JUNIOR YEAR

Group Requisite I 5	MH 406 Elem. Partial D.E. 5	PS 303 Optics 5
PS 300 Inter. Elec. & Mag. I 4	PS 302 Electronics 5	PS 421 Modern Electronics 5
MH 401 Cal. Vector Funct. 3	PS 301 Inter. Elec. & Mag. II 4	Group Requisite I 5
PS 217 Astronomy 3	Group Requisite II 3	Group Requisite II 3

SENIOR YEAR

PS 401 Theor. Physics I 5	PS 402 Theor. Physics II 5	PS 404 Thermodynamics 5
PS 415 Mod. Physics I 5	PS 416 Mod. Physics II 5	Physics Req.*** 5
Group Requisite I 5	Group Requisite II 5	Group Requisite II 6
Group Requisite II 3	PS 406 Adv. Lab. I 2	PS 407 Adv. Lab. II 2

*Students selecting chemistry for their specialization area (via Group Requisite I) will take CH 111 and CH 112 instead of CH 103 and CH 104, and CH 113 instead of ME 205, CH 303 instead of ME 321, and CH 304 instead of GL 301.

**Students not prepared for MH 161 must take MH 160 without credit.

***Students electing the nuclear science option must take PS 435. Students in other options must take PS 405 or PS 435.

Total — 207 quarter hours

GROUP REQUISITES I

AE 302 Airloads 4	EE 262 Circuits 3
AE 303 Theor. Aerodynamics I 3	EE 322 Comb. Log. Circuits 3
AE 304 Theor. Aerodynamics II 4	EE 324 Sequential Machines 3
AE 400 Viscous Aerodynamics 4	EE 361 Network Analysis 5
AE 414 Equilibrium Gasdynamics 3	EE 362 Linear Systems 5
AE 415 Jet Propulsion 5	EE 373 Electronics II 5
AE 432 Astroaerodynamics I 3	EE 425 Computer Organization 3
AE 433 Astroaerodynamics II 3	EE 471 Communications 5
CH 204 Analytical Chem. I & Lab.† 5	GL 302 Mineralogy II 5
CH 305 Organic Chemistry 5	GL 401 Sedimen.-Sed. Petrology 5
CH 407 Physical Chemistry 5	GL 402 Str. Geol. Prin. 5
CH 408 Physical Chemistry 5	GL 403 Igneous Geology & Petrology 5
CH 409 Physical Chemistry 5	ME 207 Strength of Materials I 3
CH 410 Inter. Inorganic Chemistry I 5	ME 304 Engineering Materials 3
CH 412 Chemical Thermodynamics 5	ME 322 Dynamics II 4

ME 335 Metallurgy	4	PS 405 Nuclear Physics	5
ME 340 Fluid Mech. I	3	PS 409 Intr. Reactor Physics I	5
ME 341 Fluid Mech. II	4	PS 410 Intr. Reactor Physics II	5
ME 421 Heat Transfer	4	PS 425 Prin. Nuclear Energy Systems	5
ME 450 Special Problems	1-5	PS 470 Health Physics	5

†Credit for CH 204 allowed only if CH 407 and CH 408 are completed.

GROUP REQUISITES II

A minimum total of 23 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study should include a foreign language in Group Requisite II as mentioned above; in such case they must also take a social science course for at least five hours credit.

Curriculum in Public Administration (PUB)

This curriculum is designed to prepare students for careers in the administration of governmental units. An option in Pre-City Management is designed to prepare students for graduate work in City Management. This program may be worked out with the *Public Administration Adviser*.†

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
PA 202 Ethics and Society	5	Group Req. I	3-5	Group Req. I	3-5
Group Req. I	3-5	Group Req. II	4-5	Group Req. II	4-5
EH 101 English Comp.	3	EH 102 English Comp.	3	EH 103 English Comp.	3
HY 101 World History	3	HY 102 World History	3	HY 103 World History	3
ROTC or elective	1	ROTC or elective	1	ROTC or elective	1
PE Physical Education	1	PE Physical Education	1	PE Physical Education	1

SOPHOMORE YEAR

ACF 211 Intr. Accounting	5	ACF 212 Intr. Accounting	5	PO 323 Municipal Gov't.	5
PO 209 American Gov't.	5	PO 210 State Gov't.	5	SY 202 Social Problems	5
Group Req. III	3-5	SY 201 Intr. to Sociology	5	Group Req. III	3-5
EH Literature*	3	EH Literature*	3	EH Literature*	3
ROTC or elective	1	ROTC or elective	1	ROTC or elective	1

JUNIOR YEAR

PG 211 Psychology	5	EC 200 Economics I	5	EC 202 Economics II	5
PO 325 Public Admin.	5	PG 212 Psychology	3	MN 346 Human Relations	5
SC 311 Public Speaking	5	PO 327 Policy and Admin.	5	PO 329 The Executive	3
Elective	3	PO 360 Law Enforcement	5	SY 204 Social Behavior	5

SENIOR YEAR

PO 401 Const. Law I	5	PO 402 Const. Law II	5	PO 415 Public Pers. Admin.	3
SY 405 Urban Sociology	5	Elective	3-5	MN 440 Organization Theory	5
Elective**	3-5	EC 465 Public Finance	5	PO 418 Admin. Law	3
PO 344 Scope and Methods	3	PO 328 Gov't. & the Economy	3	Elective	3-5

*EH 255-254-255 or EH 260-261-262.

**PO 450 is recommended.

Total — 201 quarter hours

GROUP REQUISITES

GROUP REQUISITE 1. The student should take (1) one mathematics course (MH 100, MH 159, MH 160, MH 161) or one natural science course plus two of the following philosophy courses: PA 210, PA 211, PA 212, PA 214, PA 216; or (2) MH 159-161 or MH 160-161; or (3) one natural science course plus one mathematics course (MH 100, MH 159, MH 160, MH 161).

†Pre-City Management Option. The Pre-City Management Option requires PO 450 and LE 462 to be taken in lieu of PO 328 and an elective.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, BI 101-103, BI 101-104, CH 101-102-104 or CH 103-104, GL 101-102, PS 205-206, or PS 220-221-222.

GROUP REQUISITE III. The student will choose from the following: CH 101-102-104 or CH 103-104 (including corresponding laboratories), HY 201, HY 202, MH 162, MH 163, PA 210, GY 203, JM 221, SC 202, FL through the elementary level as a minimum (see page 281).

Curriculum in Materials Engineering (MTL)

A curriculum in materials engineering is administered by the Department of Mechanical Engineering in the School of Engineering. It is an interdisciplinary curriculum conducted cooperatively by academic departments of the School of Engineering and the School of Arts and Sciences through a faculty Materials Engineering Curriculum Committee. (See page 177.)

School Of Business

O. D. TURNER, *Dean*

H. ELLSWORTH STEELE, *Assistant Dean*

THE SCHOOL OF BUSINESS offers curricula at the undergraduate level leading to the Bachelor of Science in Business Administration degree. It also offers work at the graduate level leading to the degrees of Master of Business Administration (MBA), Master of Science (MS), and Master of Arts in College Teaching (MACT). The Graduate School Bulletin should be referred to for more detailed information about work at the graduate level.

Objectives

The fundamental objectives of the School of Business are two: (1) to prepare students for managerial leadership careers in business and industrial organizations, and (2) to prepare students for responsible citizenship and leadership roles in society.

Accomplishment of these basic objectives requires that students acquire a sound foundation of work in the basic arts and sciences — including work in mathematics, the humanities, social sciences, and the natural sciences. There is also required a concentration of work in various functional areas of business — accounting, economics, finance, production and personnel management, marketing, statistics, and business law. In order to assure a desirable balance between courses in the arts and sciences and those in business, all programs offered by the School are designed to require that students take approximately half the total number of hours required for graduation in subject matter areas other than business and economics.

A number of professional option programs are offered to allow each student the opportunity for a reasonable degree of concentration of study in an area of major interest in the junior and senior years.

Effective managerial leadership in modern organizations requires analytical, decision-making, and communications skills. The development of these skills is emphasized — to the extent possible — in all business courses.

Co-operative Education Program

A co-operative program is offered for business students to provide an opportunity for those who desire to integrate academic training with actual business experience. For further information about this program, interested students should write to the Director, Co-operative Education, 107 Ramsay Hall, Auburn University, Auburn, Ala. 36830. See Co-operative Education Program under Special Programs in section for prospective students.

Dual Objectives Program With the School of Education

Teacher Education: Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Business to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements in the School of Business and of the Teacher Education Program, the Dean of the School of Education will recommend to the State Department of Education that the appropriate professional certificate be issued. A dual objectives program has been developed in Office Administration. (See Office Administration curriculum and suggested electives, page 133.)

Students who wish to engage in high school teaching should identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the School of Business. The advisers will counsel in their respective areas. Flexibility in scheduling course requirements is to be permitted in the pursuit of the requirements for both the School of Business curriculum and Teacher Education training.

Faculty-Advising System

Each student entering the School of Business is assigned a faculty adviser for the purpose of professional and academic counseling. New students are required to report to the Student Affairs Office in Thach Hall room 215 and then meet with their faculty adviser prior to registering for a second quarter in the school.

Students must report to Student Affairs and then to their faculty adviser to discuss the selection of a Professional Option Program during the quarter in which they expect to complete the Pre-Business Program or if they desire to change from one Professional Option to another.

Faculty advisers are also available during office hours and by appointment to offer assistance to students.

Curriculum

The basic curriculum offered by the School of Business is a four-year one leading to the degree of Bachelor of Science in Business Administration. This four-year curriculum includes three major segments: (1) Pre-Business Program, (2) the Core Curriculum, and (3) Professional Option Programs.

The Pre-Business Program consists of a two-year course of studies to be taken by all business students during the freshman and sophomore years.

The Core Curriculum consists of a group of courses, with a total credit of 50 hours, required of all business students. This group of courses is designed to provide a common body of knowledge in business and administration.

The Professional Option Programs are designed to allow students to concentrate their studies, to some degree, in a field of major interest during the junior and senior years. Each student must choose one of the Professional Option Programs to follow during his, or her, junior and senior years. There are eleven such programs: Accounting (AC), Finance (FI), Economics (EC), Geography (GY), Quantitative Methods (QM), Marketing (MK), Transportation

(TN), General Business (GB), Industrial Management (INM), Personnel Management and Industrial Relations (PIR), and Office Administration (OA).

Admissions

Students who meet the university requirements as set forth on page 18 and page 19 may enter the Pre-Business Program from high school or upon transfer from another school on the campus or from another college or university.

The Pre-Business (PB) Program

The six-quarter Pre-Business Program is designed to (1) provide the foundation in the arts and sciences which is so essential in education for leadership in modern business organizations, and (2) prepare students for admission to any one of the eleven Professional Option Programs — the latter being designed to be taken during the junior and senior years.

Each student must complete all the required courses in the Pre-Business Program before he, or she, can be formally admitted to one of the Professional Option Programs. Students who enter the School of Business as members of the freshman class will register in the Pre-Business Program and remain in it until all requirements are completed. Students who enter the School of Business by transfer, and who have not completed all requirements of the Pre-Business Program, will register in it until all requirements are completed.

Business students must complete all courses submitted to meet the requirements of the Pre-Business Program with a minimum grade point average of 1.00 (C). A student who has not progressed from the Pre-Business Program to one of the Professional Option Programs after the completion of eight quarters of study may continue to register in the Pre-Business Program only by special permission of the Dean, School of Business.

Students who have a 1.0 on hours passed may register for their remaining PB courses plus other courses required in the junior year of their proposed Professional Option Program. Students who do not meet the 1.0 grade requirement may register for their remaining PB courses plus other courses for elective credit.

The six-quarter Pre-Business Program is common to all the Professional Option Programs except those in Economics, Geography and Office Administration. Students who plan to enter one of these programs should consult with the Assistant to the Dean, Student Affairs, School of Business, prior to beginning the sophomore year.

Six-Quarter Pre-Business Program

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
EH 101 English Comp. _____ 3	EH 102 English Comp. _____ 3	EH 103 English Comp. _____ 3
*HY/EH _____ 3	*HY/EH _____ 3	*HY/EH _____ 3
MH 159 Precalc, Math or _____ 5	†MH 151 or 161 _____ 5	Math/Science _____ 5
MH 160 Algebra & Trig. _____ 5	*Science _____ 5	††Elective _____ 5
***Science _____ 5	ROTC or elective _____ 1	Elective _____ 5
ROTC or elective _____ 1	PE 102 Begin. Swim. or _____ 1	ROTC or elective _____ 1
***PE 101 Fd. of Phys. Ed. _____ 1	Group I Course _____ 1	PE Group II Course _____ 1

SOPHOMORE YEAR

First Quarter	Second Quarter	Third Quarter
ACF 211 Intr. Acct. I _____ 5	ACF 212 Intr. Acct. II _____ 5	EC 274 Statistics I _____ 5
MN 207 Data Process. _____ 5	EC 200 Economics I _____ 5	EC 202 Economics II _____ 5
PG 211 Psychology I _____ 5	SC 202 or 311 _____ 3-5	EH 345 B&P Writing _____ 5
ROTC or elective _____ 1	†††Elective _____ 5-3	ROTC or elective _____ 1
	ROTC or elective _____ 1	

*Students may take any combination of World History, HY 101-102-103, Technology and Civilization, HY 204-205-206 and Western World Literature, EH 260-261-262.

**Students entering the QM curriculum take MH 160, 161, 162, and 163, IE 204 (3 hours) in place of MN 207 and may elect MH 151 in the third quarter of the Freshman year. See departmental adviser.

***Ten hours of Science are required to be selected from any of the following courses: BI 101-102 and/or 103 or BI 101-104; CH 101-102-104 or CH 103-104; GL 101-102; PS 204 or 205-206.

****May be taken the first or second quarter of student's Freshman year. (See page 291 for details.)

†Students entering the EC curriculum take MH 161 and may elect MH 151 in their third quarter. Students entering the INM and PIR curricula should take MH 151.

††Electives may be from any area, subject to departmental requirements. During the four years of study a minimum of 83 hours must be taken in Business and Economics and a minimum of 83 hours taken in non-business subjects. The remaining hours may be from any area. The non-business subjects must include a minimum of 20 quarter hours in (A) Humanities and Fine Arts and (B) Mathematics-Natural Science electives in addition to the Freshman requirements. At least one course must be taken in each category.

†††Students who have not taken Typewriting in high school are strongly encouraged to take MN 200.

The Core Curriculum

The Core Curriculum is designed in such a manner that some courses are introductory to advanced courses, while others are more integrative in purpose. Half the total credit hours of the Core Curriculum are in courses included in the Pre-Business Program, and the remainder in the junior and senior years. Students should take these courses in the particular year in which they are prescribed.

Courses in the Core Curriculum

SOPHOMORE YEAR

	No. Hours	
EC 200-202	10	Economics I and II
ACF 211-212	10	Principles of Accounting I and II
EC 274	5	Business and Economic Statistics I
	25	

JUNIOR YEAR

ACF 361	5	Principles of Business Finance
MT 331	5	Principles of Marketing
MN 310	5	Principles of Management
MN 341	5	Business Law I
	20	

SENIOR YEAR

MN 480	5	Business Policies and Administration
Total Hours	50	

Professional Option Programs

The School of Business has four departments: Accounting and Finance, Economics and Geography, Management, and Marketing and Transportation. Each of these departments administers two or more Professional Option Programs.

Professional Option Programs are designed to allow students to concentrate advanced work in a field of major interest during the junior and senior years.

By the time he, or she, completes the Pre-Business Program each student should choose one of the Professional Option Programs to follow. Those who

wish to follow the Professional Option Programs in Economics, Geography, or Office Administration should make the choice by the beginning of the sophomore year.

The programs administered by each of the departments are listed below.

Administering Department	Programs
Accounting and Finance	Accounting (AC) Finance (FI)
Economics and Geography	Economics (EC) Geography (GY) Quantitative Methods (QM)
Management	General Business (GB) Industrial Management (INM) Office Administration (OA) Personnel Management Industrial Relations (PIR)
Marketing and Transportation	Marketing (MK) Transportation (TN)

Department of Accounting and Finance

Accounting (AC)

A sound knowledge of the fundamentals of accounting is essential to success in any economic endeavor. Accounting is indeed the language of business, and accounting procedures and records are the basic ingredients for sound management decision-making in both business and non-business organizations, including public and philanthropic bodies. Extensive financial reports are required by the Securities and Exchange Commission with the sale of stocks and bonds which form the capital structure of our economic society. They are the basis for determining income taxes due federal and state governments.

The Professional Option Program in Accounting provides broad training in the field of business and financial management. The student is required to take seven basic accounting courses above the sophomore principles courses, and may elect other courses to provide an emphasis in a particular field of managerial or public accounting.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

JUNIOR YEAR

First Quarter	Second Quarter	Third Quarter
ACF 310 Mgt. Cost & Bdgt. 5	ACF 311 Inter. Acct. 5	ACF 312 Inter. Acct. 5
ACF 361 Prin. of Bus. 5	MN 341 Bus. Law I 5	ACF 314 Income Tax 5
Finance 5	MT 331 Prin. of Mkt. 5	Elective 5
MN 310 Prin. of Mgt. 5	Elective 3	Elective 3
Elective 3		

SENIOR YEAR

Acct. Elec. 5	ACF 416 Auditing 5	Acct. Elec. 5
Dept. Elective 5	MN 480 Bus. Policy 5	Elective 5
Elective 5	Elective 5	Elective 5
Elective 3		

Total — 207 quarter hours

ACCOUNTING AND FINANCE DEPARTMENTAL ELECTIVES

Accounting

ACF 410 — Cost Accounting (5).
ACF 414 — Advanced Income Tax Acc. (5).
ACF 415 — Bus. Information and Acct. Syst. (5).
ACF 417 — Advanced Accounting (5).
ACF 418 — Accounting for Business Combinations (5).
ACF 419 — Governmental Accounting (5).
ACF 490 — Special Probs. in Accounting & Finance (5).

Finance

ACF 320 — Risk and Insurance (5).
ACF 321 — Property Insurance (5).
ACF 322 — Life Insurance (5).
ACF 323 — Real Estate (5).
ACF 340 — Personal Finance (3).
ACF 363 — Advanced Business Finance (5).
ACF 367 — Money Markets & Financial Inst. (5).
ACF 464 — Investments (5).
ACF 466 — Securities Analysis (5).
ACF 467 — Cases & Problems in Bus. Finance (5).

Three categories of electives are included in the curricula as follows: elective, accounting elective, and department elective. These should be chosen in consultation with the adviser.

Finance (FI)

In a modern capitalistic society, the influence and the responsibilities of financial executives have been expanding dramatically in recent years. Financial officers are involved in the most profound decisions affecting the strategy of business operations. They decide to expand, merge, contract, and change. They are concerned not only with the pricing of products, but with the initial decision to produce them. All aspects of business affairs ultimately reduce to dollar terms, and the financial officer's intimate and critical knowledge of the intricacies of financial operations place him in a very vital role in corporate management.

The Professional Option Program in Finance offers students an opportunity to specialize in personal and institutional finance. Courses in real estate and insurance are available.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

JUNIOR YEAR

First Quarter

ACF 310 Mgt. Cost & Bdgt. 5
ACF 361 Prin. of Bus. Finance 5
ACF 367 Money Mkts. & Financial Inst. 5
Elective 3

Second Quarter

ACF 363 Adv. Bus. Fin. 5
MT 331 Prin. of Mkt. 5
MN 310 Prin. of Mgt. 5
Elective 3

Third Quarter

ACF 320 Risk & Ins. 5
MN 341 Bus. Law I 5
Elective 3
Elective 5

SENIOR YEAR

ACF 464 Investments 5
Fin. Elective 5
Elective 5
Elective 3

ACF 467 Cases & Prob. in Bus. Fin. 5
Dept. Elective 5
Elective 5

MN 480 Bus. Policy 5
Dept. Elective 5
Elective 5

Total — 207 quarter hours

ACCOUNTING AND FINANCE DEPARTMENTAL ELECTIVES

Accounting

ACF 311 — Intermediate Accounting I (5).
ACF 312 — Intermediate Accounting II (5).
ACF 314 — Income Tax Accounting (5).
ACF 410 — Cost Accounting (5).
ACF 414 — Advanced Income Tax Acc. (5).
ACF 415 — Bus. Information and Accounting Systems (5).
ACF 416 — Auditing (5).
ACF 417 — Advanced Accounting (5).
ACF 418 — Accounting for Bus. Combinations (5).
ACF 419 — Governmental Accounting (5).

Finance

ACF 321 — Property Insurance (5).
ACF 322 — Life Insurance (5).
ACF 323 — Real Estate (5).
ACF 340 — Personal Finance (3).
ACF 490 — Special Problems in Accounting & Finance (5).

Three categories of electives are included in the curricula as follows: elective, finance elective, and departmental elective. These should be chosen in consultation with the adviser.

Department Of Economics And Geography

Business Economics (EC)

Businessmen, public officials and educators must understand the economic environment in which they live and function if they are to make sound management decisions. The Business Economics Professional Option provides the student with a background that constitutes a sound foundation for an administrative or managerial position. Furthermore, the Business Economics Curriculum is constructed so as to give the student maximum flexibility—flexibility with regard to the options open to the student after graduation. The foundation provided by the core courses in economics, the other social sciences and business along with selected electives will equip the Business Economics student to work in the areas of marketing, management, accounting, or statistics, and in addition, provides an excellent background for a student wishing to continue his education through graduate or professional study. (See also Economics Major in the School of Arts and Sciences.)

During their freshman and sophomore years, students in Business Economics should follow the regular pre-business program with three exceptions. In the second quarter of the freshman year, they take MH 161; in the third quarter of the freshman year, they take GY 203; and in the second quarter of the sophomore year, they take PA 210. As juniors and seniors they pursue the following curriculum:

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

First Quarter		JUNIOR YEAR		Third Quarter	
		Second Quarter			
PO 209	Intr. Am. Gov. _____ 5	EC 456	Inter. Macro _____ 5	MN 341	Bus. Law I _____ 5
SY 201	Intr. to Socio. _____ 5		Economics _____ 5	MT 331	Prin. of Mkt. _____ 5
EH 253	Survey Eng. _____ 3	EC 350	Labor Econ. _____ 5	EC 360	Money & Bank. _____ 5
EC 451	Inter. Micro-economics _____ 5		Elective _____ 5		
		SENIOR YEAR			
Dept. Elective _____ 5		EC 454	Hist. Ec. Thought _____ 5	MN 480	Bus. Policy* or _____ 5
Dept. Elective _____ 5			Dept. Elective _____ 5		Dept. Elective _____ 5
Option Elective _____ 5			Option Elective _____ 5		Dept. Elective _____ 5
Elective _____ 3					Option Elective _____ 5

Total — 201 quarter hours

Economics Departmental Electives are any EC designated courses except EC 206.

*Prerequisites include MN 310 and ACF 361.

Economics Department Career Option Electives (15 hours in each option)

Accounting Option: ACF 310, ACF 312, ACF 414
 Environmental Control Option: GY 201 or AM 304, IE 424, AS 409, GY 404
 Finance Option: ACF 363, ACF 367, ACF 466, AS 305, EC 464
 Graduate School Option: AS 460, EC 455, EC 462, EC 485
 Industrial Relations Option: EC 444, EC 445, MN 310 or IE 201, MN 442
 Management Option: AS 305, EC 402, EC 446, EC 471, EC 475, MN 310 or IE 201, MN 346, MN 380, PO 327
 Marketing Option: AS 301, MT 420, MT 432, MT 433, MT 434, MT 436
 Open Electives Option: all electives are open to the student
 Plant Location Option: AS 409, GY 420, GY 460, MT 472
 Public Administration Option: AS 412, EC 455, EC 462, EC 464, EC 465, PO 320, PO 327
 Regional and Urban Planning Option: EC 459, EC 464, GY 340, GY 420, GY 460
 Statistics Option: EC 374, EC 474, EC 475, (also see statistics offerings in IE or MH)
 Transportation Option: EC 471, MT 472, MT 473, MT 476

Geography (GY)

The Geography Professional Option Program prepares students to serve a vital role in various agencies of the federal, state and local governments, in private business and in teaching. Agencies which find training in geography of especial value include the Geological Survey, the Forestry Service, the State Department, the Census Bureau, and the National Park Service, as well as city and state boards of industrial planning. Geographers assist private businesses in plant location, marketing research, and resource location and development. Geography teachers are in demand at both the high school and college levels. (See also Geography major in the School of Arts and Sciences.)

Geography students follow the regular pre-business curriculum for the freshman year, except they take GY 102 — Principles of Geography — instead of an elective in the third quarter. During their sophomore, junior and senior years, Geography students take the courses shown below.

FRESHMAN YEAR

(See Pre-Business Program, page 125)

SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
ACF 211 Intr. Acct. I	5	ACF 212 Intr. Acct. II	5	EC 202 Economics II	5
GY 201 Weather & Climate	5	EC 200 Economics I	5	MN 207 Data Process	5
EH 345 B&P Writing	5	GY 203 Economic Geography	5	GY 301 Geo.-Pol. Basis	5
SP 202 App. Oral Comm.	3	ROTC or elective	1	ROTC or elective	1
ROTC or elective	1				

During their junior and senior years, students follow, with the guidance of their advisers, a specialized program in Geography with options in business, economics, and planning.

JUNIOR YEAR

GY 305 Geo. of No. America	5	MT 472 Econ. of Transp.	5	GY 407 World Resources	5
EC 274 Bus. & Econ.		GY 340 Cartography	5	Elective	3
Statistics	5	Option Elective*	5	Option Elective*	5
Elective	5	Elective	3	Elective	3

SENIOR YEAR

GY 460 Geo. of Mfg.	5	GY 400 Dev. of Geo.		GY 405 Cultural Geo.	5
Option Elective*	5	Thought	5	Elective	5
Elective	3	GY 404 Phys. Geo.	5	Elective	3
Elective	3	Option Elective*	5	Elective	3

Total — 201 quarter hours

GEOGRAPHY DEPARTMENTAL ELECTIVES

*Option electives are selected with consent of the adviser primarily from the following suggested list:

Business Option: MN 310, EC 360, MN 341, ACF 361, EC 402, MT 435, and EC 471.
Economics Option: EC 402, EC 452, EC 453, EC 457, EC 458, EC 459, and EC 471.
Planning Option: ACF 323, GY 420, and other courses pertinent to urban or regional planning.

Quantitative Methods (QM)

Businessmen and public administrators require the staff services of persons trained in statistics and quantitative methods of data analysis if they are to make sound administrative decisions. The Professional Option Program in Quantitative Methods has been developed to supply persons trained in the core requirements of business, with a sound understanding of the economic environment in which they must work and with special knowledge in statistics and quantitative methods. This program provides a strong business and economic background for persons interested in the quantitative aspects of marketing or management.

Students pursuing the Quantitative Methods Option follow the Pre-Business Program with the following exceptions: in the freshman year they take MH 160, Algebra and Trigonometry; MH 161, Analytical Geometry and Calculus; and MH 162, Calculus II. As first quarter sophomores, they take MH 163, Calculus III; and as third quarter sophomores, they take IE 204, Computer Programming. As juniors and seniors, they take the courses shown below.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
ACF 361 Prin. of Finance 5	MT 331 Prin. of Mkt. 5	MN 341 Bus. Law I 5
Elective 5	EC 474 Statistics II 5	EC 475 Quan. Methods 5
EC 374 Quality Assur. 3	Dept. Elective 5	Elective 5
Elective 5	Elective 3	Elective 3
SENIOR YEAR		
Dept. Elective 5	Option Elective* 5	MN 480 Bus. Policy** (or
Option Elective* 5	Dept. Elective 5	Dept. Elective) 5
Elective 5	Elective 5	Elective 5
Elective 3		Elective 5

Total — 207 quarter hours

*Students must take 10 hours from EC 460, EC 485, MH 467, MH 468, IE 416, and IE 440.

**Prerequisites include MN 310 and ACF 361.

Departmental electives may be selected from any EC 300 or EC 400 level course in the Department of Economics and Geography and general electives from any department within the University. Suggested electives include any of the option electives plus MH 266, MH 267, MH 405, EC 451, EC 456, IE 314, IE 315, IE 316. Credit cannot be received for EC 206.

Department of Management**General Business (GB)**

The General Business Professional Option Program is designed for students who desire a broad, general business education. It requires a minimum of business courses. The student has a wide choice of elective courses.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
ACF 310 Mgt. Cost & Bdgt. 5	MN 341 Business Law I 5	ACF 361 Prin. of Finance 5
MT 331 Prin. of Mkt. 5	MN 346 H.R. in Mgt. 5	MN 342 Business Law II or
MN 310 Prin. of Mgt. 5	EC 350 Labor Economics or	MN 455 Legal Envrmt. 5
*Hum.-Soc. Elective 3	EC 445 Indust. Relations 5	Hum.-Soc. Elective 3
	Hum.-Soc. Elective 3	Elective 5
SENIOR YEAR		
MN 442 Personnel Mgt. or	EC 446 Business Cycles or	MN 480 Bus. Policies 5
MN 380 Industrial Mgt. 5	EC 465 Public Finance 5	MT 472 Econ. of Trans. 5
EC 452 Comp. Econ. Sys. 5	GY 404, 405, or 407 5	Elective 5
Elective 5	Elective 5	
	Elective 3	

Total — 207 quarter hours

*Hum.-Soc. Electives must be selected from Economics, History, Literature, Philosophy, Political Science, Psychology, or Sociology.

Electives in the junior and senior years may be selected from the 300 and 400 level course offerings of departments outside the School of Business.

Industrial Management (INM)

The Professional Option Program in Industrial Management is designed for students who wish to prepare themselves for managerial positions in industrial organizations. It requires study in computer applications, quantitative

methods, human relations, management, and the utilization of these studies in management decision-making. Also, the student is permitted some free electives which he may use to study areas outside the School of Business.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
MN 310 Prin. of Mgt. _____ 5	ACF 310 Mgt. Cost. & Bdgt. _____ 5	ACF 361 Prin. of Finance _____ 5
MT 331 Prin. of Mkt. _____ 5	MN 346 Mgt. Hum. Rel. _____ 5	MN 380 Industrial Mgt. _____ 5
MN 341 Business Law I _____ 5	EC 445 Ind. Relations _____ 5	MT 436 Mkt. Res. Meth. _____ 5
EC 374 Quality Assurance _____ 3	*Hum-Soc. Elective _____ 3	Hum-Soc. Elective _____ 3
SENIOR YEAR		
MN 481 Mgt. Analysis _____ 5	MN 482 Mgt. Info. Sys. _____ 5	MN 480 Bus. Policies _____ 5
**Dept. Elective _____ 5	**Dept. Elective _____ 5	**Dept. Elective _____ 5
***Elective _____ 5	***Elective _____ 5	***Elective _____ 5
	*Hum-Soc. Elective _____ 3	

Total — 207 quarter hours

*Human-Social Electives in the Junior and Senior years must be selected from Economics, History, Literature, Philosophy, Political Science, Psychology, or Sociology.

**Departmental Electives must be selected from the 300 and 400 level courses of the Management Department.

***Electives in the Senior year may be selected from the 300 and 400 level course offerings in the School of Business or other Schools in the University.

Personnel Management and Industrial Relations (PIR)

The Personnel Management and Industrial Relations Program is designed to prepare students for managing the personnel and industrial relations activities of various kinds of organizations. It blends studies in the areas of psychology, sociology, labor, industrial relations, and personnel management activities into a decision-making pattern for the organization's dealings with individual employees and unions. In addition, the program provides some free electives that the student may use to pursue studies of personal interest.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

JUNIOR YEAR		
First Quarter	Second Quarter	Third Quarter
MT 331 Prin. of Mkt. _____ 5	MN 442 Personnel Mgt. _____ 5	ACF 361 Prin. of Bus. Fin. _____ 5
MN 310 Prin. of Mgt. _____ 5	SY 201 Intr. Sociology _____ 5	MN 341 Business Law I _____ 5
EC 350 Labor Economics _____ 5	EC 474 Statistics II _____ 5	MN 346 Mgt. Hum. Rel. _____ 5
*Hum-Soc. Elective _____ 3	*Hum-Soc. Elective _____ 3	*Hum-Soc. Elective _____ 3
SENIOR YEAR		
EC 444 Labor Legis. _____ 5	MN 449 Adv. Personnel Mgt. _____ 5	MN 480 Bus. Policies _____ 5
PG 461 Ind. Psychology or _____ 5	MN 444 Coll. Bar. Arb. _____ 5	MN 447 Wage & Sal. Adm. _____ 5
SY 408 Ind. Sociology _____ 5	**Dept. Elective _____ 5	**Elective _____ 5
**Elective _____ 5	*Hum-Soc. Elective _____ 3	

Total — 207 quarter hours

*Hum-Soc. Electives in the Junior and Senior years must be selected from Economics, History, Literature, Philosophy, Political Science, Psychology, or Sociology.

**Elective in the Senior year may be selected from the 300 and 400 level course offerings in the School of Business or other departments in the University.

***The Departmental Elective must be selected from the 300 and 400 level course offerings of the Department of Management.

Office Administration (OA)

The Office Administration Program is designed to prepare students to become professional secretaries, administrative assistants or for other responsible positions in business, government, or professional offices.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101 English Comp.	3	EH 102 English Comp.	3	EH 103 English Comp.	3
HY 101 World History	3	HY 102 World History	3	HY 103 World History	3
MH 159 or 160	5	Elective	5	Elective	5
Science	5	Science	5	MN 200 Type I or	
PE 101 Fd. of Phys. Ed*	1	PE 102 Begin. Swim. or		MN 201 Type II**	3
		Group I Course	1	PE Group II Course***	1

SOPHOMORE YEAR

EC 200 Economics I	5	ACF 211 Intr. Acct.	5	ACF 212 Intr. Acct.	5
MN 210 Shorthand I	5	MN 211 Shorthand II	5	MN 212 Shorthand III	5
MN 201 Type II or		MN 202 Type III or	3	EH 345 B&P Writing	5
MN 202 Type III	3	MN 203 Type IV	2	Elective	3
SC 202 App. Sp. Comm.	3	EC 202 Economics II	5		

JUNIOR YEAR

MN 300 Transcription I	5	MN 301 Trans. II	5	MN 400 Office Mach.	5
EC 274 Statistics	5	MT 331 Marketing	5	MN 341 Bus. Law I	5
SY 201 Intr. to Soc.	5	Elective	5	ACF 361 Pr. Bus. Fin.	5
Elective	3	Elective	3	MN 305 Records Mgt.	3

SENIOR YEAR

MN 403 Sec. Pro. I	5	MN 404 Sec. Pr. II	5	MN 402 Office Appren.	5
MN 207 Elec. Data Proc.	5	Elective	5	MN 405 Adm. Mgt. or	
Elective	5	Elective	5	MN 310 Prin. of Mgt.	5
Elective	3	Elective	3	Elective	5

*May be taken the first or second quarter of the student's freshman year. (See pages 290.)

**Students with no previous typing experience should take Typewriting I, II, and III. Students with one year in high school, take II, III, and IV. Students with two years in high school should consult with OA staff.

***Students taking PE 102 may select a course in either Group I or Group II.

A total of 205 or 206 quarter hours is required for graduation.

The nonbusiness subjects must include a minimum of 20 quarter hours in (a) humanities and (b) mathematics-natural science electives in addition to the uniformly required courses of the University in the freshman year. At least one course must be taken in each category.

Dual Objectives Program

Students may complement the Office Administration program by choosing suggested electives to prepare to teach. A Dual Objectives Program has been developed to meet the requirements in both the School of Business and the School of Education. By fulfilling the requirements of this program, the student earns a B.S. degree and qualifies to teach business subjects in secondary schools. The student who elects this program should make his wishes known as soon as possible to the Dean of the School of Business and the Dean of the School of Education in order to facilitate program planning and to minimize the possibility of undue delays. (See statement of Dual Objectives Program and consult Dean's office for details.)

Department of Marketing and Transportation

Marketing dominates in the management of business in the United States. It is an area of constant adjustment to needs of existing and potential consumers in a dynamic society. The changing size and locations of firm operations and the increasing quantity of new products continually entering the market are making more complex the vital functions of marketing and transportation. It is important that students understand both the economic and social implications of marketing and distribution; these options are designed to enable them to recognize and analyze problems in both areas.

Marketing (MK)

The professional marketing option develops and prepares students for interesting and challenging positions in sales, advertising, marketing research, and marketing management.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

JUNIOR YEAR		
Second Quarter		
MT 331 Prin. of Mkt. _____ 5	ACF 361 Prin. of Finance _____ 5	MT 435 Marketing Prob. _____ 5
MN 310 Prin. of Mgt. _____ 5	ACF 310 Mgt. Cost. & Bdg. _____ 5	MN 341 Business Law I _____ 5
SY 201 Sociology _____ 5	Elective _____ 5	Elective _____ 5
Elective _____ 3	Elective _____ 3	Elective _____ 3
SENIOR YEAR		
MT 436 Mkt. Research _____ 5	MN 480 Bus. Policies _____ 5	Dept. Elective _____ 5
MT 437 Sales Mgt. _____ 5	Dept. Elective _____ 5	Dept. Elective _____ 5
Elective _____ 5	Elective _____ 5	Elective _____ 5
Elective _____ 3		

Total — 207 quarter hours

Electives for the Marketing and Transportation Options may be selected from the 300, 400 level courses in the School of Business or other departments of the University upon approval of the student's adviser. Departmental electives may be selected from the 400 level course offerings of the Department of Marketing and Transportation.

Transportation (TN)

The professional transportation option is designed to give students an understanding of the interrelationship existing within marketing logistics and our national transportation system. This program prepares students for various positions in industrial firms, in government, and with the various carriers.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 125)

JUNIOR YEAR		
Second Quarter		
MT 331 Prin. of Mkt. _____ 5	MT 472 Econ. of Transp. _____ 5	MT 435 Marketing Prob. _____ 5
MN 310 Prin. of Mgt. _____ 5	ACF 361 Prin. of Finance _____ 5	MN 341 Bus. Law I _____ 5
SY 201 Sociology _____ 5	ACF 310 Mgt. Cost. & Bdg. _____ 5	MT 475 Transp. Reg. Ind. _____ 5
Elective _____ 3	Elective _____ 3	Elective _____ 3
SENIOR YEAR		
MT 436 Mkt. Research _____ 5	MT 476 Motor Trans. _____ 5	Dept. Elective _____ 5
MT 473 Logistics Mgt. _____ 5	MN 480 Bus. Policies _____ 5	Elective _____ 5
Elective _____ 5	Elective _____ 5	Elective _____ 5
Elective _____ 3		

Total — 207 quarter hours

Electives for the Marketing and Transportation Options may be selected from the 300, 400 level courses in the School of Business or other departments of the University upon approval of the student's adviser. Departmental electives may be selected from the 400 level course offerings of the Department of Marketing and Transportation.

MARKETING AND TRANSPORTATION DEPARTMENTAL ELECTIVES

Marketing	Transportation
MT 432 Promotional Strategy (5)	MT 472 Economics of Transportation (5)
MT 433 Retail Store Management (5)	MT 473 Logistics Management (5)
MT 434 Purchasing (5)	MT 475 Transportation and Regulated Industries (5)
MT 435 Marketing Problems (5)	MT 476 Motor Transportation (5)
MT 436 Marketing Research Methods (5)	MT 490 Special Problems in Transportation (1-10)
MT 437 Sales Management (5)	
MT 438 Marketing Channel Systems (5)	
MT 440 International Marketing (5)	
MT 441 Consumer Analysis (5)	
MT 490 Special Problems in Marketing (1-10)	

School of Education

TRUMAN M. PIERCE, *Dean*

J. FOSTER WATKINS, *Assistant Dean*

THE SCHOOL OF EDUCATION is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary teachers and school service personnel with the doctor's degree as the highest degree approved.

Professional preparation programs are provided for service in the fields of curriculum and teaching; administration and supervision; counselor education; and educational media. Undergraduate programs lead to the degree of Bachelor of Science in Education. Programs administered by the Graduate School lead to the degrees of Master of Education, the Master of Science, Specialist in Education, and Doctor of Education.

Programs and Degrees

Undergraduate

The Department of Educational Media prepares school library, educational media, and audio-visual personnel. Undergraduate minors are required to complete an elementary or secondary teaching credential in conjunction with their studies in media for certification as a school librarian. The Department provides a service function to the School of Education by offering courses which relate to all areas of professional education.

The Department of Elementary Education prepares teachers in the following programs of study: Early Childhood Education (in cooperation with The Department of Family and Child Development), Elementary Education, and Special Education (Mental Retardation and Behavior Disturbances). These curricula lead to the degree of Bachelor of Science in Education and include study in the liberal arts, psychology, educational theory and practice, laboratory experiences, and provision for concentrations.

The Department of Foundations of Education provides a service function within the School of Education. Courses which relate to the total educational enterprise and which are ordinarily included in the program of study of all students in teacher education are offered through this department. Courses in human development, educational psychology, philosophy, sociology and history of education, and research and experimentation are offered.

The Department of Health, Physical Education, and Recreation prepares teachers of health and physical education for grades one through 12. This curriculum leads to the degree of Bachelor of Science in Education and includes

study in the liberal arts, psychology, educational theory and practice, laboratory experiences, and specialization in health, physical education, and recreation administration.

The Department of Secondary Education prepares teachers for secondary schools. This curriculum leads to the degree of Bachelor of Science in Education and includes study in the liberal arts, specialization in a major and minor teaching field, psychology, educational theory and practice, and laboratory experiences. Specialization in teaching fields include Art, English, Foreign Languages, Mathematics, Music, Science, Social Science, Speech Communication, Speech Pathology, and Theatre.

The Department of Vocational and Adult Education prepares professional personnel in one of the following fields of specialization: adult education, agricultural education, basic vocational education, business education, distributive education, home economics education, industrial arts education, rehabilitation services education, and trade and industrial education. These programs lead to the degree of Bachelor of Science in Education and prepare professional personnel for Career Development Programs at all levels, including post-secondary and adult education. Curricula include study in liberal arts, psychology, educational theory and practice, laboratory experiences, and in one of the above fields of specialization. All curricula require a common core in professional and vocational education.

Interdepartmental Education provides courses in curriculum and teaching, special education, and higher education.

Dual Objectives Program

Students who are enrolled in Schools other than the School of Education who wish to complete requirements for graduation in an academic department and also to complete requirements of the Teacher Education Program may pursue the dual objectives program.

A student electing to pursue the dual objectives program will have an adviser in the academic department in which he is enrolled and an adviser in the School of Education. Advising the student concerning the curriculum of the academic department, including the major, minor and other requirements, will be the responsibility of the adviser in that department. The responsibility for advising the student on matters concerning the Teacher Education Program will be that of the adviser in the School of Education. The quarterly course schedule of the student will be approved by both advisers. Information describing the dual objectives program is available in the Student Personnel Office of the School of Education in Haley Center and in the Office of the Dean of the School in which the student is enrolled.

Applications and specific information about the criteria for selection and admission to Teacher Education are available in the Student Personnel Office in Haley Center, 3084.

Graduate

Graduate programs are offered through the Graduate School in administration and supervision; counselor education; educational media; elementary edu-

cation; health education; physical education; secondary education; and vocational and adult education.

Fifth and sixth-year programs of study in the above areas lead to the degrees of Master of Science, Master of Education, and Specialist in Education.

A program leading to the degree of Doctor of Education is offered with areas of specialization in Counselor Education, Educational Administration and Supervision, Elementary Education, Secondary Education, and Vocational and Adult Education. Specializations in Secondary Education include the following sub-specializations: (a) Language Arts Education, (b) Mathematics Education, (c) Science Education, and (d) Social Science Education. See Graduate School Bulletin.

Programs leading to the degrees of Master of Education, Master of Science in Education, Specialist in Education, and Doctor of Education are offered for junior college administrators, student personnel administrators, and teachers. These programs meet requirements of the Southern Association of Colleges and Schools, the Graduate School, and the School of Education. Sufficient flexibility exists to permit students to adapt programs to their individual needs. Course guides for each of the various programs are available in the Office of the Dean of Education.

Related Programs and Services

Teacher Certification Services

Programs in the School of Education are approved by the National Council for Accreditation of Teacher Education and the Alabama State Board of Education for certifying superintendents, supervisors, principals, counselors, elementary and secondary teachers, and educational media specialists. Upon satisfactory completion of a prescribed course of study and upon recommendation of the Dean of the School of Education a professional certificate will be issued by the appropriate State Department of Education. Twenty-eight State Departments of Education now have reciprocal agreements for issuing certificates to graduates of institutions accredited by NCATE.

Students who are enrolled in schools other than the School of Education who wish to complete requirements for graduation in an academic department and also to complete requirements of the Teacher Education Program may pursue the dual objectives program. (See page 136.) Students may also take courses in education and psychology for acquiring knowledge and understanding of human growth and development, and teaching as a profession. They are eligible to take all such courses for which they satisfy prerequisites.

For detailed requirements for the Professional Certificate (Ranks B, A, or AA), consult the Alabama State Department of Education Bulletin 1966, No. 14, available in the office of the Dean of the School of Education.

Student Personnel Services

VIRADA K. SCHUESSLER, *Coordinator*
Haley Center 3084

The Student Personnel Services Program of the School of Education assists the student in understanding the University and becoming a part of it, in

identifying his strengths and limitations, in determining his professional goals, in selecting the proper curriculum in the University, and in securing employment upon graduation.

Recruitment. — Able young people are encouraged to consider teaching as a profession. Efforts of organizations such as the Future Teachers of America in the secondary schools and the Student National Education Association in colleges and of individuals and groups in the profession are aimed at seeking out, informing, and encouraging students.

Financial Aid. — Opportunities for financial aid are available in part-time employment and loans. One type of loan, the Student Loan Program financed by the National Defense Education Act, provides low-interest, long-term loan funds that are particularly attractive to School of Education students because of special provision for the prospective public school teacher. The NDEA provides that if a student goes into teaching in a public elementary or secondary school, up to 50 per cent of the principal (plus interest) of the loan may be cancelled.

Information and applications for NDEA loans, other financial aid, and employment may be obtained from the Office of Student Financial Aid.

Orientation. — The Orientation Program provides University personnel with an understanding of the student's background, individuality, and needs. It assists the student in obtaining information about the University and its programs, in learning more about himself, and in selecting professional goals that are compatible with his abilities. All freshmen, transfer students and students pursuing the dual objectives program participate in an orientation program for two quarters.

Counseling. — Each Education student is assigned to a faculty adviser who assists the student whenever possible. Other sources of assistance include personnel in the Office of the Dean, classroom teachers, personnel in the Student Counseling Service, the offices of the Dean of Women, the Dean of Student Affairs, the Registrar, dormitory head residents and counselors, and ministers of local churches.

The Selective Admission and Retention Program in Teacher Education. — The Teacher Education Program is composed of three basic components: the pre-professional program; professional education, including the professional internship; and major and minor teaching fields.

The student will normally complete during his first two years the pre-professional program. Upon completion of 90 quarter hours of appropriate general education courses, the student should submit a written application to the Committee on Selective Admission and Retention to Teacher Education. Criteria for admission are: (1) evidence of adequate scholastic ability, (2) completion of general education requirements, (3) an overall grade point average of 1.0 (C), (4) evidence of proficiency in English, (5) completion of the Pre-Teaching Field Experience Program, and (6) potential for teaching, evidence of emotional stability, and absence of undesirable personal characteristics.

These criteria also apply to transfer students.

While retention in the Teacher Education Program is based on the continuous evaluation of the student, a formal evaluation takes place as a prerequisite for admission to the professional internship. At least one quarter prior

to the internship the student must submit to the Selective Admission and Retention Committee a formal application for internship approved by his adviser. Requirements for admission to the professional internship are: (1) admission to the Teacher Education Program, (2) completion of appropriate courses in area of specialization, (3) a grade point average of 1.25 in all courses completed in professional education and in the teaching major and minor, and (4) evidence of emotional stability and absence of undesirable personal characteristics.

In order to be eligible for graduation with teacher certification, a student will be expected to complete the requirements identified above and achieve a grade point average of 1.5 in his courses in education and in his teaching major and minor.

Persons with degrees other than in education may make application for study in a curriculum leading to professional certification. Academic background and work experience are evaluated for purpose of developing the most effective program possible for each student.

Applications and specific information about the criteria of selection for admission to teacher education are available from the Student Personnel Office in Haley Center 3084.

Placement and Follow-up. — The Teacher Placement Service provides assistance to prospective teachers in locating desirable positions and assistance to employers in identifying candidates. Persons interested in placement should contact the Student Personnel Office, Haley Center 3084. Follow-up studies of successes, failures, and problems of graduates are made. Further information may be obtained from the Coordinator of Student Personnel Services in Haley Center.

Field Services

R. S. CLARK, *Coordinator*
Haley Center 3002

Field Services constitute the phase of the work of the School of Education which is designed to make the programs and services of the School available to individuals and groups off campus. Field Services enable the School to combine its three major functions: instruction, research, and extension; and make them available to off-campus groups for continuous improvement of public education in the State and region. Major categories of services are available. These follow:

Off-Campus Instruction. — This instruction is available through the Field Laboratory Program, enabling teachers in service to complete a total of 16 quarter hours of residence credit toward a graduate degree. The program uses the local school setting as a laboratory in which graduate courses are provided as a framework for solving instructional problems related to various areas of study. The program may be used as a supplement to existing in-service programs or as a basis for developing such programs.

Short courses may also be offered on a non-credit basis for groups interested in specific areas of education and psychology. The courses may consist of a

series of lectures or workshops and are available to groups of professional and non-professional personnel interested in short courses in some specific aspect of their work.

Educational Television. — Resources and materials of the School of Education are presented to Alabama citizens through the facilities of the Alabama Education Television Network. Telecasts direct and enrich teaching programs for elementary and secondary school students, and assist teachers in their professional career development programs.

Further information regarding Educational Television at Auburn University is contained elsewhere in this Bulletin. A schedule of courses and specific course study guides may be obtained by writing the Director, Educational Television, Auburn University.

Lecture and Consultative Service. — The staff of the School of Education is composed of persons who are skilled in general and specific areas of education. The Office of Field Services coordinates the services of these faculty members for lecture and consultative services. These services may be used with in-service education, school and community projects, teacher workshops and institutes, and community clubs and organizations.

School Surveys. — School systems desiring comprehensive school surveys or surveys in specific areas of education such as school plant utilization and construction, school finance, administrative organization, and curriculum and teaching programs, may secure services of this type from the School of Education. Surveys may be conducted as separate projects or in conjunction with the Field Laboratory Program described above.

Research Services. — School systems may wish to conduct research in such areas as the instructional program, administrative and supervisory patterns and organizations, school and community projects, the development and evaluation of testing programs, and the use of instructional materials and facilities. The assistance of the staff of the School of Education is available for these activities, either as separate endeavors or in conjunction with the instructional and survey services described above.

Correspondence Study. — Correspondence study provides undergraduate instruction for persons unable to attend college on a regular basis. Courses parallel to those given on campus are available in English, education, economics, health, physical education and recreation, history, mathematics, psychology, and sociology. Other courses may be added as the demand warrants. All the courses carry college credit. For information concerning the Correspondence Study Program of Auburn University, see page 46 of this Catalog.

Learning Resources Center

WILLIAM E. HUG, *Head*
Department of Educational Media

The Learning Resources Center (LRC) located in Haley Center is the service component of the Department of Educational Media to the School of Education. The LRC provides media services to the School of Education which includes maintaining extensive collections of filmstrips, transparencies, disc

recordings, tape recordings, kits, educational games, and programs of instruction. LRC personnel assist the faculty and students in the School of Education with the production, selection, and utilization of learning materials.

In-Service Agricultural Education and Supervision

BEN P. DILWORTH, *State Supervisor*

ASSISTANT SUPERVISORS GREEN, HOLLEY, HALCOMB, LEWIS, SELLERS, AND WHITE

In cooperation with the State Department of Education, the School of Education maintains an in-service teacher education and supervisory division. This service extends to 400 departments of vocational agriculture in accredited high schools of the State.

Vocational Rehabilitation Service

F. W. JENKINS, *Assistant Area Supervisor*

ROBERTS, *District Supervisor*

CANTRELL, CAUGHRAN, LAMBERT, *Counselors*

The State Department of Education in cooperation with Auburn University maintains the local Rehabilitation Service which provides vocational guidance, counseling, training, and placement services to handicapped citizens. The Rehabilitation Service also makes available to handicapped citizens such services as: surgical and/or medical care, hospitalization, therapeutic treatment, and artificial appliances, when these services are essential to training and/or employment and the individual is not financially able to secure them.

Undergraduate Curricula for the Preparation of Teachers

The following statements set forth requirements and guides for the development of programs for students pursuing a teacher education curriculum. Requirements for the pre-professional program, the program of professional education, and the fields of teaching specialization are stated. Listed also are scholastic requirements, total credit requirements, recommended courses, and provisions for electives in the different preparation programs.

I. Scholastic Requirements

Students enrolled in the School of Education or those enrolled in other Schools who are pursuing the Dual Objectives Program must meet the following scholastic requirements: a grade point average of 1.0 (on a 3 point scale) for admission to Teacher Education and a grade point average of 1.25 in all courses completed in professional education and in the teaching major and minor for admission to the professional internship. A grade point average of 1.5 in courses in education and the teaching major and minor is expected for graduation with certification.

II. Pre-Professional Requirements

The pre-professional program as outlined partially fulfills the liberal arts requirement for students preparing to enter a teacher preparation program leading to professional certification as a teacher in elementary and/or secondary schools. A major portion of the pre-professional requirements will be completed prior to admission to the teacher education program.

English

EH 101-102-103 English Composition (3-3-3)	9
SC 202 Applied Speech Communication (3)	3
Literature (American, English or World)	9

Social Science

HY 101-102-103 World History (3-3-3)	9
or	
HY 204-205-206 Technology and Civilization (3-3-3)	9
SY 201 Introduction to Sociology (5)	5
Approved Social Science electives selected from Economics, Geography, History, Political Science and Sociology	10

Science

Biological

BI 101 Prin. of Biology (5)	5
BI 102 General Plant Biology (5)	
BI 103 General Animal Biology (5)	Select 1 5
BI 104 Biology in Human Affairs (5)	
VM 220 Human Anatomy and Physiology (5)	
(For Health and Physical Education majors only)	

Physical

CH 101-102-103L General Chemistry (2-2-1)	
or CH 103-104	
PS 204 Funds. of Physics (5)	
GL 101-102 Intr. Geology (5)	
AM 304 Meteorology (5)	Select 2 10
AY 310 Earth Science (5)	
SED 473 Gen. Science for Tchrs. (5)	
PHS 100-101 Physical Science (5-5)	
(For Elementary Majors Only)	
PHS 151-152 Physical Science (5-5)	

Mathematics

Approved Math Course (5)	5
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Physical Education

PE 101-102 or Group I, Group II (1-1-1)	3
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Orientation

Freshman Orientation or Transfer Orientation (1)	1
Introduction to Laboratory Experiences (1)	1

Foundations of Education

FED 213 Human Development (5)	5
FED 214 Psychological Foundations of Education (5)	5

III. Professional Requirements

This phase of the Teacher Education Program develops competence in the content and skills of professional teacher education. It adds depth of understanding and gives social meanings to the knowledge acquired. Required pro-

professional studies are concerned with the growth and development of the individual, the nature of society, and the functions of education in society. Through the study of professional literature, observations, and laboratory experiences, the student acquires knowledge regarding the history and philosophy of education, the administration and organization of schools, curriculum development, teaching and learning processes, learning resources, and the evaluation of teaching effectiveness.

A. Foundations of Education

The philosophical, social, and psychological Foundations of Education provide background resources essential to effective participation in the teaching profession. The field emphasizes the concepts, principles, and theories essential for understanding and improving educational practices in light of historical developments and current social needs. Formal classwork includes an analysis of historical, philosophical, social, and psychological considerations upon which the educational enterprise is based.

Foundations of Education provides the resources and methods of formulating, evaluating, and revising educational policies, curriculum designs, schemes of school organization and support, and strategies for teaching and learning. All students in the teacher preparation program will complete FED 213, Human Growth and Development; FED 214, Psychological Foundations of Education; FED 320, Social Foundations of Education; and FED 480, Philosophical Foundations of Education. Evaluation of the aims and achievements of the educational enterprise as a whole is a concern of each of these Foundational studies. Also, required laboratory experiences, including the Pre-Teaching Field Experience and the Professional Internship, are evaluated in one or more of these Foundations courses.

B. Teaching and Program

This phase of the teacher preparation program is designed to assist the student in acquiring the knowledge, understanding, and skills deemed essential for success in the different specializations. Curriculum development, methodology, teaching and learning resources, and evaluation of teaching effectiveness are emphasized in the various areas of specialization. Each student in the teacher preparation program will complete the courses listed under the school program in which he is preparing to teach.

1. Elementary Education

A. Early Childhood Education	
EED 320 Curriculum for Early Childhood Education I	10
EED 420 Curriculum for Early Childhood Education II	10
EED 455 Analysis of Early Childhood Education Programs	3
B. Elementary Education	
EED 301B Curriculum I	10
EED 401B Curriculum II	10
EED 450 Analysis of Elementary Instructional Strategies	3
C. Special Education (Mental Retardation and Behavior Disturbances)	
EED 301C or 301D Curriculum I	10
EED 401C or 401D Curriculum II	10

2. Secondary Education

SED 405 Teaching in Secondary School, or	
IED 414 Teaching in Elementary and Secondary Schools (Major Fields)	8

SED 410 Program in Secondary School, or	
IED 423 Program in Elementary and Secondary Schools (Major Field)	3
SED 405 Teaching in Secondary School, or	
SED 410 Program in Secondary School (Minor Field) or	
IED, HPR, or VED 414 Teaching in Elementary and Secondary School, or	
IED, HPR, or VED 423 Program in Elementary and Secondary Schools (Minor Field)	3

3. Vocational and Adult Education

VED 410 Occupational Information	3
*VED 414 Program in Area of Specialization	3
*VED 415 Teaching in Area of Specialization	3
VED 456 Learning Resources in Area of Specialization	3
VED 423 Program in Basic Vocational Education (Minor Field)	3

*Teaching and Program courses VED 411 and VED 412, are required in major for students in home economics education.

4. Health, Physical Education, Recreation

A. Health Education	
HPR 414A Teaching in Elementary Schools and Secondary Schools, and	
HPR 423A Program in Area of Specialization (Major Field)	6
*Minor Field	3
B. Health and Physical Education	
HPR 414B Teaching in Elementary and Secondary Schools, and	
HPR 423B Program in Area of Specialization (Major Field)	6
*Minor Field	3
C. Health, Physical Education, Recreation composite major-minor	
See B above for Major Field	6
D. Recreation Administration	
HPR 423C Program in Area of Specialization	3
SED 405 Teaching in Secondary Schools, or	
SED 410 Program in Secondary School (Minor Field)	
or	
IED or VED 414 Teaching in Elementary and Secondary Schools	
IED or VED 423 Program in Elementary and Secondary Schools	

C. Laboratory Experiences

The Laboratory Experiences Program provides sequential learning opportunities in public school and community settings for all students throughout the teacher preparation program. Laboratory experiences are provided primarily through the following programs: (1) **Pre-teaching Field Experience Program**, (2) **Extended Laboratory Experiences** including a para-professional level program for secondary majors, (3) **Cooperative Education Program**, and (4) the **Professional Internship**.

The **Pre-teaching Field Experience Program** provides an initial base-line laboratory experience for all students in the teacher preparation program. It is initiated in the course, *Introduction to Laboratory Experiences* (EED, SED, VED 104 and HPR 108), with specific follow-up responsibilities assigned to the Foundations Department (FED 213, FED 214, and FED 320). Students are required to participate in the program a minimum of ten full days at the beginning of the public school term in the fall quarter of the year. This experience, a prerequisite for admission to the Professional Teacher Education Program, involves the student in planning and evaluating learning experiences, counseling, participation in pre-school conferences and faculty study, school and community meetings, and involvement in actual teaching situations.

The **Extended Laboratory Experiences Program** provides meaningful laboratory experiences for students concurrently with their enrollment in professional education courses (EED 301 and FED 214; EED 401 and FED 320; SED 405 and 410; HPR 414 and 423; IED 414 and 423; VED 414 and 423). These courses are scheduled to provide the student an opportunity to gain work experiences in the Auburn, Opelika, or Lee County Schools.

The Co-operative Education Program provides laboratory experiences for certain students involved in the teacher preparation program on an alternating quarter arrangement with college attendance. (For description see page 47.)

The Professional Internship is a full time assignment in an off-campus school and community. Experiences include personal and professional contacts with various phases of community life and the application of concepts, skills, and knowledge the student has acquired in classroom situations.

The student enrolls for 15 credit hours and devotes a full quarter to the internship. The program is divided into three phases: orientation, off-campus experience, and evaluation. Students must be admitted to the Teacher Education Program prior to the Professional Internship and must have completed appropriate courses in their areas of specialization.

The Internship for students with a major or minor in art; theatre; health, physical education and recreation; industrial arts; music; speech communication, and speech pathology, requires experience in both elementary and secondary schools. Students in either secondary or elementary education who complete a minor in educational media (school library science) are required to devote a part of their Internship to appropriate experiences in the school library.

Students who have had teaching experience or other related experiences may be permitted to satisfy the Internship through a special program which is offered for ten quarter hours credit during the Summer Quarter in lieu of the Professional Internship. Students will be considered on an individual basis for the special program.

When the Professional Internship is completed in more than one curriculum area, students may register for a total of 15 quarter hours in combinations of five and ten quarter hours. Professional Internship courses in the various departments are listed as follows:

- EED 425 Professional Internship in Elementary Schools
- IED 425 Professional Internship in Elementary and Secondary Schools
- HPR 425 Professional Internship in Health and Physical Education in Elementary and Secondary Schools
- SED 425 Professional Internship in Secondary Schools
- VED 425 Professional Internship in Vocational and Adult Education

Other laboratory experiences for students are provided within the framework of courses in the Teacher Education Program.

IV. Requirements for Major and Minor Fields of Specialization

Requirements listed below represent minimum hours for a major and a minor in the respective fields of specialization. The number of hours listed for each field of specialization is exclusive of courses completed in pre-professional and professional education. The requirements also exclude the use of any course as partial fulfillment for both the major and the minor field of study.

SUBJECT	MINOR	MAJOR
Adult Education	24	48
Agricultural Education		75

General Agriculture	75
Technical Agriculture	75
Art	35
Basic Vocational Education	
Basic Ag.	28
Basic Build. Construc.	28
Basic Distrib. Ed.	26
Basic Metal Tech.	29
Basic Power Mech.	29
Business Education	
General Business	67
Office Admin.	67
Composite Major - Minor - Business Management	
Management Services	80
Distributive Education	28
Composite Major - Minor	70
Educational Media	28
English	20
Foreign Language	30
Health Education	31
Health and Phys. Education	
Health, Phys. Ed., Recreation	56
Composite Major - Minor	77
Home Economics	68
Composite Major - Minor	86-88
Industrial Arts	27
Composite Major - Minors:	
Basic Power Mech.	75
Basic Metal Tech.	75
Basic Drafting and Design	75
Mathematics	85
Composite Major - Minor	77
Music	28
Composite Major - Minors:	
Instru. and Choral	
Choral and Elem. School Music	89
Recreation Admin.	34
Rehab. Services Ed.	57
Science	
Gen. Science	45
Biolog. Science	30
Gen. Physics	28
Physics	27
Chemistry	30
Social Science	
Gen. Soc. Science	40
Economics	30
Geography	30
Sociology	30
History	30
Polit. Science	30
Psychology	28
Speech Comm.	32
Speech Path.	54
Theatre	32
Trade and Indus. Ed.	60

ADULT EDUCATION**Minor: 24 Hours**

VED 413 Nature of Adult Education	5
VED 414 (f) Program in Adult Education	3
VED 466 Teaching Out-Of-School Groups	3
VED 491 Problems in Teaching Dis-	
advantaged Adults	3
Approved Electives from 300-400	10

Major: 48 Hours

Minor Requirements	24
VED 410 Occupational Information	3
VED 415 (f) Teaching in Adult Education	3
VED 425 (f) Internship in Adult Education	15
VED 456 (f) Learning Resources in Adult	
Education	3

AGRICULTURAL EDUCATION**Major: 75 Hours**

AS 301 Agricultural Marketing	5
AS 401 Farm Management	5
VED 404 Practicum in General Metals	5
VED 406 Practicum in Building Construction	5
AY 307 General Soils	5

ADS 200 Introductory to Animal and	
Dairy Science	5
HF 221 Landscape Gardening	5
ZY 402 Economic Entomology	5
Approved Electives in Gen.	
Agriculture or Technical	
Agriculture	85

ART**Minor: 35 Hours**

AT 105 Drawing I	5
AT 106 Drawing II	5
AT 181 Design Fundamentals I	5
AT 182 Design Fundamentals II	5
AT 222 Painting I	5
AT 338 Art History I	5
AT 342 Elementary School Art	5

Major: 50 Hours

Minor Requirements	35
AT 227 Sculpture I	5
AT 322 Painting III	5
AT	5
Approved Elective	5

BASIC VOCATIONAL EDUCATION

Students pursuing a course of study in basic vocational education must select both a major and minor within the Department of Vocational and Adult Education.

A. Basic Agricultural Education**Minor: 28 Hours**

HF 221 Landscape Gardening	5
HF 224 Plant Propagation	5
ADS 204 Animal Nutrition	5
AS 401 Farm Management	5
AS 410 Agriculture Business Management	3
AY 307 General Soils	5

Major: 43 Hours

Minor Requirements	28
ADS 303 Livestock Production	5
AY 201 Grain Crops	5
AY 401 Forage Crops	5

B. Basic Building Construction**Minor: 28 Hours**

BT 101 Intr. to Buildings	5
BT 102 Drawing and Projections	5
BT 206 Materials and Construction	5
VED 404 Practicum in General Metals	5
VED 405 The School Shop	3
VED 406 Practicum in Building Construction and Maintenance	5

Major: 43 Hours

Minor Requirements	28
BT 220 Mechanics of Structure	5
BT 421 Construction Problems I	5
VED 407 Practicum in Electricity	5

C. Basic Distributive Business**Minor: 26 Hours**

MT 331 Principles of Marketing	5
MT 333 Salesmanship	3
MT 433 Retail Store Management	5
HE 306 Personal Appearance and Social Interaction	3
VED 462 Directed Work Experience	5
Approved Elective	5

Major: 44 Hours

Minor Requirements	26
ACF 211 Intr. to Accounting	5
MN 341 Business Law	5
MT 432 Advertising	3
MT 438 Retail Merchandising	5

D. Basic Metal Technology**Minor: 29 Hours**

TS 102 Engineering Drawing I	2
TS 105 Engineering Drawing II	2
TS 112 Welding Science and Application	1
TS 113 Machine Tool Laboratory	1
TS 114 Sheet Metal Design and Fabrication	1
TS 115 Foundry Technology	1
TS 308 Gages and Measurements	5
TS 406 Problems in Machining	5
VED 404 Practicum in General Metals	5
VED 405 The School Shop	3

Major: 43 Hours

Minor Requirements	29
EG 204 Kinematics of Machines	3
TS 301 Manufacturing Processes-Casting	3
TS 307 General Metals	5
TS 405 Problems in Welding Engineering	5

E. Basic Power Mechanics**Minor: 29 Hours**

TS 102 Engineering Drawing I	2
TS 105 Engineering Drawing II	2
TS 204 Kinematics of Machines	3
TS 113 Machine Tool Laboratory	1
TS 308 Gages and Measurements	5
VED 400 Introduction to Power Mechanics	5
VED 401 Practicum in Small Gasoline Engines	5

VED 402 Automotive Construction and Repair	5
VED 405 The School Shop	3

Major: 44 Hours

Minor Requirements	29
TS 406 Problems in Machining	5
VED 404 Practicum in General Metals	5
Approved Elective	5

BUSINESS EDUCATION***A. General Business****Major: 67 Hours**

MN 200, 201, 202 Typewriting I, II, III	9
ACF 211, 212, 311, 312 Accounting	20
MN 207 Elec. Data Pro. Principles	5
MN 305 Records Management	3
MN 310 Principles of Management	5
MT 331 Principles of Marketing	5
MN 341 Business Law	5
EH 345 Business and Professional Writing	5
MN 400 Office Machines	5
MN 405 Administrative Management	5

B. Office Administration**Major: 67 Hours**

MN 200, 201, 202 Typewriting I, II, III	9
MN 210, 211, 212, 300 Shorthand I, II, III, Transcription I	20
ACF 211, 212 Accounting	10
MN 207 Elec. Data Pro. & Computer Prog.	5
MN 305 Records Management	3
MN 310 Principles of Management	5
MN 341 Business Law	5
MN 400 Office Machines	5
MN 403 Secretarial Procedures I	5

C. Business Management**Composite Major-Minor: 80 Hours**

MN 200, 201, 202 Typewriting I, II, III	9
ACF 211, 212, 311, 312 Accounting	20
MN 207 Elec. Data Pro. & Computer Prog.	5
MN 305 Records Management	3
ACF 340 Personal Finance or	
MN 447 Job Evaluation	3
MN 341, 342 Business Law	10
EH 345 Business and Professional Writing	5
EC 350 Labor Economics	5
EC 360 Money and Banking	5
MN 400 Office Machines	5
MT 331 Principles of Marketing	5

D. Management Services**Composite Major-Minor: 80 Hours**

MN 200, 201, 202 Typewriting I, II, III	9
MN 210, 211, 212, 300 Shorthand I, II, III, Transcription I	20
ACF 211, 212 Accounting	10
IE 301 Elec. Data Pro. & Computer Prog.	5
MN 305 Records Management	3
MN 310 Principles of Management	5
ACF 340 Personal Finance	3
MN 341 Business Law	5
EC 360 Money and Banking	5
MN 400 Office Machines	5
MN 403 Secretarial Procedures I	5
MT 331 Principles of Marketing	5

*EC 200 and 202 to be taken in social science general education area. For the 5 hours of required mathematics MH 159 or 160 is recommended. MH 161 may profitably be used as an elective.

DISTRIBUTIVE EDUCATION**Minor: 28 hours**

EC 202 Economics II	5
MT 331 Principles of Marketing	5
EC 274 Bus. Econ. Statistics I	5
MN 340 Personal Finance	5
EC 350 Labor Problems	5
MT 432 Promotional Strategy	5

Composite Major-Minor: 70

EC 202 Economics II	5
MT 331 Principles of Marketing	5
EC 274 Business & Economic Statistics I	5
MN 340 Personal Finance	3
EC 350 Labor Problems	5
MT 432 Promotional Strategies, Pr. MT 331	5
MT 433 Retail Store Management	5
MT 434 Purchasing	5
MT 435 Marketing Problems	5
MT 438 Retail Merchandizing	5
MT 442 Personnel Management	5
ED 458 Coordination & Supervision in VED	3
VED 462 Directed Work Experience	5
Electives in area of interest	9

EDUCATIONAL MEDIA

(School Library and Audio-Visual Personnel)

Minor: 28 Hours

EM 400 Learning Resources	4
EM 410 Media for Children	4
EM 415 Media for Young Adults	4
EM 430 Reference Materials and Services	4
EM 440 Organization and Administration of Media Services	4
EM 450 Classification and Cataloging of Media	4
EM 495 Practicum in Media Service	4

ENGLISH**Minor: 20 Hours**

EH 390 Advanced Composition	5
EH 401 Advanced Grammar or	
EH 441 Introduction to the Study of Language	5
Approved Electives 300-400 English Courses	10

Major: 40 Hours

Minor Requirements	20
EH 357 or 358 Survey of American Literature	5
EH 451 or 452 Shakespeare	5
Approved Electives 300-400 English Courses	10

FOREIGN LANGUAGE**A. Spanish****Minor: 30 Hours**

FL 131 Elementary Spanish	5
FL 132 Elementary Spanish	5
FL 231 Intermediate Spanish	5
FL 232 Intermediate Spanish	5
FL 331 Advanced Spanish	5
FL 332 Advanced Spanish	5

Major: 40 Hours

Minor Requirements	30
FL 431 Contemp. Spanish Lit. I	5
FL 432 Contemp. Spanish Lit. II	5

B. German**Minor: 30 Hours**

FL 151 Elementary German	5
FL 152 Elementary German	5
FL 251 Intermediate German	5
FL 252 Intermediate German	5
FL 351 Advanced German	5
FL 352 Advanced German	5

Major: 40 Hours

Minor Requirements	30
FL 451 History of German Literature	5
FL 452 History of German Language	5

C. French**Minor: 30 Hours**

FL 121 Elementary French	5
FL 122 Elementary French	5
FL 221 Intermediate French	5
FL 222 Intermediate French	5
FL 321 Advanced French	5
FL 322 Advanced French	5

Major: 40 Hours

Minor Requirements	30
FL 421 History of French Literature	5
FL 422 History of French Language	5

HEALTH EDUCATION**Minor: 31 Hours**

HPR 195 Health Science	3
HPR 295 School and Community Health	3
HPR 396 Drug Use and Abuse	3
HPR 395 Health Instruction	3
HPR 495 First Aid	3
NF 119 Nutrition and Man	3
NF 353 Community & Family Health	3
Approved Health Electives	10

Major: 52 Hours

Minor Requirement	31
EH 141 Medical Vocabulary	5
HPR 496 Problems of Health Education and Health Observation of School Children	5
IED 476 Exceptional Child	5
PY 428 Public Health	5
Approved Health Elective	5

HEALTH AND PHYSICAL EDUCATION**Major: 56 Hours**

PE Courses in Physical Education Service Program (3 courses in areas other than those taken to meet general education requirements)	3
HPR Theory and Techniques (choice of 4 courses) - HPR 117, 118, 119, 120, 121, 122, 123	8
HPR 195 Health Science	3
HPR 201 History and Principles of Health, Physical Education and Recreation	5
HPR 212 Elementary School Activities	3
*HPR 315 Kinesiology	3
HPR 295 School and Community Health	3
HPR 316 Evaluation in Health, Physical Education & Recreation	3
HPR 385 Principles of Recreation	3
HPR 395 Health Instruction	3
HPR Teaching and Coaching (choice of 1 course) 202, 203, 204, 206, 207, 208, 209, 210	5
HPR 401 Organization and Administration of Health, Physical Education and Recreation	5
HPR 405 Physiology of Muscular Activity	3
VM 221 Anatomy and Physiology	5
HPR Approved electives in Health or Physical Education	5

*Prerequisites: VM 221, Physics 204.

HEALTH, PHYSICAL EDUCATION AND RECREATION**Composite Major-Minor: 77 hours**

Major Requirements (Health and Physical Education)	56
HPR 386 Recreation Leadership	3
HPR 485 Social Recreation	3
HPR 403 First Aid	3
HPR 416 Adaptive Physical Education	3
HPR Teaching and Coaching (choice of 1 course) HPR 202, 203, 204, 206, 207, 208, 209, 210	5
HPR Approved elective in Health Education	3
HPR Approved elective in Recreation	3

HOME ECONOMICS**Major: 68 Hours**

NF 104 Prin. of Foods and Nutrition	5
CA 110 Contemporary Home Economics	1
CA 113 Housing For Man	3
CA 115 Clothing and Man	3
CA 105 Fundamentals of Clothing	5
CA 116 Art for Everyday Living	3

NF 112 Nutrition and Man	3
NF 204 Meal Management	5
CA 205 Clothing for the Family	3
CA 206 Garment Structure	3
HF 225 Flower Arranging	3
FCD 257 The Family and Human Development	3
CA 233 Home Equipment	5
CA 303 The House Select 1	5
CA 313 Home Furnishings	5
CA 343 Interior Home Problems	5
CA 431 Man-Environmental Relations	2
FCD 323 Management for Modern Living	3
FCD 443 Home Management Residence	5
FCD 457 Family Relations	5
Approved Electives	3
FCD 307 Growth and Development of Children	5

Composite Major-Minor

Major Requirements	68
Completion of A, B, C or D	18-20

A. Clothing and Textiles

CA 355 Consumer Textiles	3
CA 395 Clothing Design	5
CA 455 Flat Pattern Designing	5
Approved Electives from 300-400 courses	5

B. Family Life and Child Development

FCD 327 The Child in a Culturally Disadvantaged Family	5
FCD 317 Adolescent and the Family	5
FCD 417 Guidance of Children	5
FCD 467 Parent Education	5

C. Nutrition and Foods

NF 358 Community and Family Health	3
NF 362 Problems in Community Nutrition	3
NF 432 Family Nutrition	3
NF 472 Advanced Community Nutrition	3
NF 489 International Nutrition	3
NF 492 Infant and Child Nutrition	5

D. Home Management, Housing and Equipment

CA 233 Home Equipment or CA 313 Home Furnishings	5
CA 303 The House or CA 343 Interior Home Problems	5
FCD 453 The Consumer and the Market	5
FCD 463 Family Economics	5

INDUSTRIAL ARTS EDUCATION**Minor: 27 Hours**

TS 111 Woodworking	1
TS 112 Welding Science	1
TS 113 Machine Tool Laboratory	1
TS 114 Sheet Metal Design	1
TS 115 Foundry Technology	1
TS 402 Advanced Wood	5
TS 307 General Metals	5
VED 407 Practicum in Electricity	5
CA 345 Creative Crafts	2
VED 246 Instructional Drawing	3
TS 102 Engineering Drawing	2

Major: 50 Hours

VED 406 Practicum in Building Construction and Maintenance	5
VED 409 Teaching Electronics in Industrial Arts	5
Elective in Metal Area	5
Elective in Power Area	5
Elective in Drawing Area	3

A. BASIC POWER MECHANICS**Composite Major-Minor: 75 hours**

VED 246 Instructional Drawing	3
TS 102 Engineering Drawing I	2
TS 105 Engineering Drawing II	2
TS 113 Machine Tool Lab.	1

TS 308 Gages & Measurements	5
VED 400 Introduction to Power Mechanics	5
VED 401 Practicum in Small Engines	5
VED 402 Automotive Construction & Repair	5
AN 352 Tractors and Engines	5
VED 405 The School Shop	3
TS 111 Woodworking	1
TS 112 Welding Science	1
TS 114 Sheet Metal Design	1
TS 115 Foundry Technology	1
TS 307 General Metals	5
or	
VED 404 Practicum in General Metals	5
VED 407 Practicum in Electricity	5
CA 345 Creative Crafts	3
TS 402 Advanced Woods	5
VED 409 Teach. Electronics in Indust. Arts	5
MN 310 Principles of Management	5
or	
PG 461 Industrial Psychology	
EM 400 Learning Resources	4
Electives	8

B. BASIC METAL TECHNOLOGY**Composite Major-Minor: 75 hours**

VED 246 Instructional Drawing	3
TS 102 Engineering Drawing I	2
TS 105 Engineering Drawing II	2
TS 112 Welding Science	1
TS 113 Machine Tool Lab.	1
TS 114 Sheet Metal Design	1
TS 115 Foundry Technology	1
TS 308 Gages & Measurements	5
TS 406 Problems in Machining	5
VED 404 Practicum in General Metals	5
or	
TS 307 General Metals	5
TS 405 Problems in Welding	5
TS 204 Kinematics of Machines	3
VED 405 The School Shop	3
VED 400 Introduction to Power Mechanics	5
VED 401 Practicum in Small Engines	5
or	
VED 402 Automotive Construction & Repair	5
TS 111 Woodworking	1
TS 402 Advanced Woods	5
MN 310 Principles of Management	5
or	
PG 461 Industrial Psychology	
EM 400 Learning Resources	3
CA 345 Creative Crafts	2
VED 407 Practicum in Electricity	5
VED 409 Teach. Electronics in Industrial Arts	5
Electives	3

C. BASIC DRAFTING & DESIGN**Composite Major-Minor: 75 hours**

VED 246 Instructional Drawing	3
TS 102 Engineering Drawing I	2
TS 105 Engineering Drawing II	2
TS 104 Descriptive Geometry	2
TS 106 Graphical Methods	2
AR 360 Appreciation of Architecture	3
BT 101 Introduction to Buildings	3
BT 102 Drawing and Projections	3
BT 206 Materials and Construction	5
CA 333 Lighting Equipment	3
TS 112 Welding Science	1
TS 113 Machine Tool Lab.	1
TS 114 Sheet Metal Design	1
TS 115 Foundry Technology	1
TS 308 Gages and Measurements	5
VED 405 The School Shop	3
TS 111 Woodworking	1
TS 402 Advanced Woods	5
VED 407 Practicum in Electricity	5
VED 409 Teach. Electronics in Industrial Arts	5
VED 400 Introduction to Power Mechanics	5
or	
VED 401 Practicum in Small Engines	5
CA 345 Creative Crafts	2
EM 400 Learning Resources	4
VED 404 Practicum in General Metals	5
or	
TS 307 General Metals	5
Electives	3

MATHEMATICS**Minor: 35 Hours**

MH 160	Precalculus with Trigonometry	5
MH 161	Analytic Geom. & Cal. I	5
MH 162	Analytic Geom. & Cal. II	5
MH 163	Analytic Geom. & Cal. III	5
MH 264	Analytic Geom. & Cal. IV	5
MH 331	Intr. to Modern Alg. I	5
MH 441	Geom., A Modern View I	5

Major: 55 Hours

Minor requirements		35
MH 332	Intr. to Mod. Alg. II	5
MH 467	Mathematical Statistics	5
MH 420	Analysis I	5
Approved Elective		5

Composite Major-Minor: 77 hours

MH 160	Pre-Calculus w. Trigonometry	5
MH 161	Analytic Geometry & Calculus I	5
MH 162	Analytic Geometry & Calculus II	5
MH 163	Analytic Geometry & Calculus III	5
MH 264	Analytic Geometry & Calculus IV	5
MH 265	Linear Differential Equations	3
MH 266	Topics in Linear Algebra	3
MH 331	Introduction to Modern Algebra	5
MH 332	Introduction to Modern Algebra	5
MH 441	Geometry, A Modern View I	5
Geometry Elective		5
MH 420	Analysis I	5
MH 467	Statistics	5
IE 204	Computer Programming	3
IE 301	Information Retrieval	3
IE 315	Linear Programming	3
IE 316	Electronic Data Process. Sys. Des.	3
IE 416	Operational Analysis II	3

MUSIC**Minor: 28 Hours**

MU 131, 132	Material and Organization of Music	10
MU 187, 188, 189, 287, 288, 289	Applied Music, preferably in one area, but if in two areas four hours must be in one area.	6
MU 352, 353	Music History II & III	6
MU 361	Conducting I	3
One of the following:		
EED 396	(if major interest is in Elementary School Music)	
or SID 494	(if major interest in music is instrumental music)	3
or SED 495	(if major interest is choral music)	
Organization of Choral Music		

Major: 72 Hours

Minor Requirements in Music		28
Band, Choir, Orchestra, or Choral Union		11
MU 133, 251, 232, 233		20
MU 351	Music History	3
MU 387, 388, 389, 487, 488	Applied Music	5
MU 362	Conducting	1
SED 494	Organization of Instrumental Music	
or SED 495	Organization of Choral Music	3
Music Elective		1

Composite Major - Minor: 89 Hours

Major Requirements	72
Completion of A or B below	17

A. INSTRUMENTAL AND CHORAL

SED 494 or SED 495 (the one not completed in the music major)	3
MU 113, 114, 115, 116, 117, 118, or 119	5
MU 477	Music Arranging
MU 409	Marching Band Techniques
MU 454	Instrumental Music Literature

B. CHORAL AND ELEMENTARY SCHOOL MUSIC

EED 396	Music for the Elementary Teacher	3
MU	Electives	5
MU 478	Music Arranging	3
MU 452	Vocal Literature	3
MU 453	Choral Literature	3

RECREATION ADMINISTRATION**Minor: 34 Hours**

HPR 201	History and Principles of Health, Physical Education, and Recreation	3
HPR 385	Principles of Recreation	3
HPR 386	Recreation Leadership	3
HPR 387	Outdoor Recreation	3
HPR 388	Camp Management	3
HPR 401	Organization and Administration of Health, Physical Education, and Recreation	5
HPR 485	Social Recreation	3
HPR 423C	Program - Recreation	3
HPR 495	First Aid	3
SV 405	Urban Sociology	5

Major: 79 Hours

CA 145	Minor Requirements	34
FY 303	Creative Crafts	2
FY 303	Forest Recreation	3
HPR	Theory and Techniques (Choice of 3 courses): HPR 117, 118, 119, 120, 121, 122, 123	6
HPR	Teaching and Coaching (Choice of 1 course): HPR 202, 203, 204, 206, 207, 208, 209, 210	3
HPR 316	Evaluation in Health, Physical Education, and Recreation	3
HPR 425C	Professional Internship	15
JM 221	Beginning Newswriting	5
PE 165	Camping	1
PE 166	Family Recreation	1
PO 325	Introduction to Public Administration	5
TH 307	Children's Theatre	3

REHABILITATION SERVICES EDUCATION**Major: 57 Hours**

VED 330	Careers in Rehabilitation	5
PG 212	Introduction to Psychology II	3
SY 305	Culture and Personality	3
SY 406	Introduction to Social Welfare	5
VM 210	Human Physiology	5
SC 273	Group Problem Solving Through Discussion	5
GED 421	Guidance in the Public Schools	5
Approved Electives in Area of Specialization		25

SCIENCE**A. General Science****Major: 45 Hours**

CH 103-4	General Chemistry	10
BI 103	Biology	5
PS 205-6	General Physics	10
SED 473	General Science for Teachers	5
Approved Electives (5 hrs. must be from biological science)		15

B. Biological Science**Minor: 30 Hours**

BI 103	Biology	5
ZY 214	Vertebrate Physiology & Anatomy	5
Approved Electives		20

Major: 45 Hours

Minor Requirements		30
Approved Electives		15

C. GENERAL PHYSICS**Minor: 28 hours**

PS 205-6	Introductory Physics	10
PS 210	Principles of Modern Physics	5
PS 217	Astronomy	3
PS 417	Introduction to Biophysics	5
PS 470	Health Physics	5

*D. Physics Minor: 27 Hours

PS 220	Gen. Physics I	4
PS 221	Gen. Physics II	4
PS 222	Gen. Physics III	4
PS 301	Intermediate Electricity and Magnetism	5
PS 305	Modern Physics	5
PS 302	Electronics	5

Major: 42 Hours

Minor Requirements _____ 27

Approved Electives to be selected from:

PS 415	Intr. to Quantum Mech.	5
PS 421	Modern Electronics	5
PS 303	Optics	5
PS 435	Intr. to Solid State Physics	15

*Physics majors will complete minor in mathematics (including MH 361).

E. Chemistry Minor: 30 Hours

CH 103	General Chemistry	5
CH 104	General Chemistry	5
CH 105	General Chemistry	5
CH 207	Organic Chemistry	5
CH 208	Organic Chemistry	5
	Approved Elective	5

Major: 45 Hours

Minor requirements _____ 30

Approved Electives _____ 15

Prerequisites for CH 105. Credit in these courses applied to general education requirement in physical science.

SOCIAL SCIENCE

All students majoring in political science, sociology, economics, or geography, and not minoring in history; and all students minoring in political science, sociology, economics, geography or psychology and not majoring in history; must include in their social science general education requirements the following:

U. S. History _____ 5 hours

Major: 45 Hours

HY 202	United States History	5
EC 200	Economics I	5
PO 209	Introduction to American Government	5
GY 102	or 203 Prins. of Econ. Geography	5
	Approved elective from 300-400 course in U. S. History	5
	Approved electives from 300-400 courses in Sociology, Economics, Political Science and Geography	20

1. Economics Minor: 30 Hours

EC 200	Economics I	5
EC 202	Economics II	5
EC 456	Intermediate Macro Economics	5
EC 452	Comparative Economics Systems	5
	Approved 300-400 level economics courses	10

Major: 40 Hours

Minor requirements _____ 30

EC 274	(Business and Ec. Statistics I)	5
	Approved 300-400 level Ec. courses	5

2. Geography Minor: 30 Hours

GY 102	Principles of Geography	5
GY 203	Economic Geography	5
GY 405	Cultural Geography of the World	5
	Approved 300-400 level courses in GY	15

Major: 40 Hours

Minor requirements _____ 30

Approved 300-400 level GY Courses _____ 10

3. Sociology Minor: 30 Hours

SY 202	Social Problems	5
SY 203	Cultural Anthropology	5
	Approved 300-400 level Sociology Courses	20

Major: 40 Hours

Minor requirements _____ 30

SY 304	Minority Groups	5
SY 308	Juvenile Delinquency	5

4. History

Minor: 30 Hours

U. S. HY	(5 hours above freshman level)	10
	Selections from Latin American area	5
	Selections from non-western, non-American area	5
	Approved 300-400 level history courses	10

Major: 40 Hours

Minor requirements _____ 30

Selected 300-400 level courses in areas of student's choice providing depth study in one area _____ 10

5. Political Science Minor: 30 Hours

PO 209	National Government	5
PO 210	State Government	5
PO 309	Intr. to International Relations or	5
PO 312	An Intr. to Comparative Gov.	5
	Approved 300-400 level PO courses	15

Major: 40 Hours

Minor requirements _____ 30

PO 422	Recent and Contemporary Political Theory	5
PO 340	Political Parties and Politics, PO 323 Municipal Gov. in the U.S., PO 405 Metropolitan Area Gov. Problems or	5
PO 445	The Gov. and Politics of the Developing Nations	5

6. Psychology Minor: 28 Hours

PG 211	Psychology I	5
PG 215	Quantitative Methods in Psychology	4
PG 330	Social Psychology	4
PG 415	Psychology Testing	5
PG 480	History of Psychology	4
PG	Elective	3
PG 212	Psychology II	3

SPEECH Minor: 32 Hours

SC 201	Sp. Comm. Theories	5
SC 200	Intr. to Sp. Comm.	5
SC 273	Group Discussion	5
SC 220	Interpretive Reading	5
SC 230	Fundamentals of Radio and TV Broadcasting	5
SC 311	Public Speaking	5
SED 201P	Communication Problems	2

Major: 47 Hours

Minor requirements _____ 32

SC 278	Argumentation and Debate	5
	Approved 300-400 level Speech Courses	10

SPEECH PATHOLOGY*

Major: 34 Hours

SC 340	The Speech and Hearing Mechanism	5
SC 341	Phonetics	3
SC 355	Clinical Procedures in Speech	3
	(This course offered for 1-3 hours credit should be taken for 1 hour credit three consecutive quarters.)	
SC 365	Clinical Procedures in Hearing	3
	(This course offered for 1-3 hours credit should be taken for 1 hour credit three consecutive quarters.)	
SC 460	Introduction to Audiology	5
SC 461	Hearing Pathology	5

SC 451 Speech Correction I	5
SC 452 Speech Correction II	5
SC 453 Speech Correction III	5
IED 476 Exceptional Child	5
FED 434 Personality Dynamics	5
SC 401 Psychology of Communication	5
Additional work required: 200 clock hours in an approved Speech and Hearing Clinic	
Major requirements	

*Completion of this program meets preprofessional certification requirements of the American Speech and Hearing Association.

THEATRE

Minor: 32 Hours

TH 104 Intr. Theatre I	3
TH 105 Intr. Theatre II	3
TH 106 Intr. Theatre Projects	3
TH 204 Fund. of Acting I: Voice	5
TH 205 Fund. of Acting II: Movement	5
TH 206 Acting I	5
TH 304 Fund. of Stage Design	5
TH 107 Stage Craft I	1
TH 108 Stage Craft II	1
TH 109 Stage Craft Project	1
TH 201 Theatre Artists in Society I	3
TH 202 Theatre Artists in Society II	3
TH 203 Theories of Acting	3

TH 301 History of Theatre in Western Civilization	3
Major: 37 Hours	
Minor Requirements	32
TH 305 Design in the Theatre I	5
TH 306 Design in the Theatre II	5
TH 404 Directing I	5
TH 405 Directing II	5
TH 406 Directing III	5
TH 302 History of Theatre in Western Civilization	3
TH 303 History of Theatre in Western Civilization	3
TH 401 Play Analysis	3
TH 402 World Theatre	3
TH 403 Seminar & Theatre Research	3

TRADE AND INDUSTRIAL EDUCATION

Major: 60 Hours

VED 475-480 Trade and Industrial Exp.	30
EH 345 Business and Professional Writing	5
MN 310 Business Organization and Management	5
EC 350 Labor Problems	5
MT 331 Principles of Marketing	5
VED 458 Coord. and Supervision of VED	3
VED 246 Instructional Drawing	3
Approved Electives	4

†Credit for VED 475-480 (inc.) (5-5-5-5-5-5) by supervised employment or by examination on basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to journeyman level. If employment experience required for certification is obtained prior to starting the curriculum, elective coursework may be substituted for these credits. Time required to complete curriculum would be reduced accordingly.

V. Guides for the Completion of Curricular Requirements for Programs in Education

The following guides set forth requirements and suggestions for preparing personnel for education professions. Each program is listed by title and indicates the total number of hours and appropriate sequence for the completion of each curriculum. Male students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

The Dean reserves the privilege of making substitutions in course requirements, provided such modifications do not conflict with state requirements or university regulations as to degrees in Education.

A. Elementary Education (EED)

1. Early Childhood Education Program

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
EED 103 Orientation	EH 102 English Comp.	EED 104 Intr. to Lab
EH 101 English Comp.	BI 104 Biology	Experiences
BI 101 Biology	HY 102 World History	EH 103 English Comp.
HY 101 World History	or HY 205 Tech. & Civliz.	HY 103 World History
or HY 204 Tech. & Civliz.	SC 202 App. Sp. Comm.	or HY 206 Tech. & Civliz.
GY 102 Prin. of Geog.	PE 102 Begin. Swimming	SC 273 Group Prob. Solving
PE 101 Fnds. of Phys. Ed.	or Gr. I	Through Discussion
	HPR 211 Sensorimotor Act.	(Gr. II)
		Elective

SOPHOMORE YEAR

MH 281 Elem. Math.	MH 282 Elem. Math.	FCD 307 Growth & Dev.
EH 253 English Lit.	EH 254 Sur. Eng. Lit.	of Children
SV 201 Intr. Sociology	FCD 217 Comparative	EC 200 Economics
FED 213 Human Growth	Family Life	PO 209 U.S. Government or
and Development	SV 203 Cultural Anthro-	HY 201 History of U.S.
	pology or	MU 371 Intr. to Music
	SV 202 Social Problems	
	Elective	

JUNIOR YEAR

First Quarter

PHS 100 Physical Science	5
TH 307 Children's Theatre	3
or	
TH 308 Creative Dramatics	3
AT 342 Elem. Sch. Art	5
EM 472 Media for Children	4
Elective	3

Second Quarter

PHS 101 Physical Science	5
SC 450 Prin. of Sp. Corr.	5
PG 350 Behavior Modifi-	
cation	5
Elective	3

Third Quarter

FED 214 Psych. Fnds. of	
Education	5
EED 320 Curriculum for	
Early Childhood	
Education	10

SENIOR YEAR

FED 320 Social Fnds. of	
Education	5
EED 420 Curriculum for	
Early Childhood	
Education	10

EED 425A Internship in	
Early Childhood	
Education	15

FED 480 Phil. Fnds. of	
Education	5
EED 455 Analysis of Early	
Childhood Education	
Programs	3
FCD 467 Parent Education	5
Elective	5

Total — 210 quarter hours

2. Elementary Education

FRESHMAN YEAR

First Quarter

EH 101 English Comp.	3
HY 101 World History or	
HY 204 Tech. and Civiliz.	3
BI 101 Prin. of Biology	5
EED 105 Orientation	1
PE 101 Fnds. of Phys.	
Education	1
Elective	3

Second Quarter

EH 102 English Comp.	3
HY 102 World History or	
HY 205 Tech. and Civiliz.	3
BI 104 Biology in Human	
Affairs	5
SC 202 App. Sp. Comm.	3
PE 102 Begin. Swimming	
(or Gr. I)	1
Elective	3

Third Quarter

EH 103 English Comp.	3
HY 103 World History or	
HY 206 Tech. and Civiliz.	3
GY 102 Prin. of Geog.	
or	
GY 203 Economic Geog.	5
EED 104 Orientation to Lab.	
Experiences	1
PE (Gr. II)	1
Elective	5

SOPHOMORE YEAR

MH 281 Elem. Math.	5
SY 201 Intr. Sociology	5
HPR 212 Elem. School	
Activities	3
Approved Lit. Elect.	3
Elective	3

MH 282 Elem. Math.	5
EC 200 Economics I	5
MU 371 Intr. to Music	3
App. Lit. Elective	3-5

MH 283 Elem. Math	3
PO 209 U.S. Government	
or	
HY 201 History of U.S.	5
Elective	3
Approved Lit. Elect.	5

JUNIOR YEAR

AT 342 Elem. Sch. Art	5
Physical Science	5
Electives	9

SC 450 Prin. of Speech	
Correction	5
FED 215 Human Growth	
and Development	5
Physical Science	5
Elective	4

FED 214 Psych. Fnds. of	
Education	5
EED 301B Curriculum	
I, Reading and	
Other Lang. Arts;	
Music and Related	
Arts	10

SENIOR YEAR

FED 320 Social Fnds. of	
Education	5
EED 401-401B Curriculum	
II, Math; Natural	
and Social Sciences	10

EED 425B Professional	
Internship Elem.	15

FED 480 Phil. Fnds. of	
Education	5
EED 450 Analysis of	
Instructional	
Strategies	3
English Elective	3
Electives	9

Total — 210 quarter hours

Students majoring in Elementary Education are required to develop an area of concentration with a minimum of twenty hours course work selected from one of the following areas:

ART

Art

AT 105 Drawing I	5
AT 106 Drawing II	5
AT 181 Design Fundamentals I	5
AT 182 Design Fundamentals II	5
AT 222 Painting I	5
AT 224 Painting II	5
AT 227 Sculpture I	5
AT 338 Art History I	5

BOTANY AND PLANT PATHOLOGY

BI 102 Plant Biology	5
BY 308 Plants in Action	3
BY 405 Intr. Mycology	5
BY 406 Systematic Botany	5
BY 410 Aquatic Plants	5
BY 411 Phycology	5
BY 414 Plant Morphology	5
BY 415 Dev. Plant Anatomy	5

CREATIVE ARTS**Art**

AT 338 Art History I	5
CA 345 Creative Crafts	3

Dance

HPR 278 Social & Folk Dance	2
HPR 213 Dance for Children	3

Music

EED 396 Music Appreciation	3
EED 496 Music in Elem. School	4
MU 373 Music Appreciation	3
MU 374 Masterpieces of Music	3

Theatre

TH 101-2-3 Intr. to the Arts	1
TH 307 Children's Theatre	3
TH 308 Creative Dramatics	3
TH 425-26 Theatre Practice in the School	5

CULTURALLY DIFFERENT

FCD 327 Child in Cultr. Dis. Fam.	5
FCD 497 Internship in Agcys. Serv. Chrn. & Families (prereq.)	5
SY 304 Minority Groups (Jr. Standing)	5
SY 405 Urban Soc. (Jr. Standing)	5
FCD 217 Comp. Family Life	3
FCD 310 Tch. of Interviewing (Approval of Dept.)	2
SY 305 Culture & Personality	3
SY 308 Juvenile Delinquency	5
SY 406 Intr. to Soc. Wf. (Jr. Standing)	5
FED 434 Per. Dyn. & Effect. Behvr.	5

EDUCATIONAL MEDIA (Library)

EM 400 Learning Resources	4
EM 410 Media for Children	4
EM 415 Media for Young Adults	4
EM 430 Ref. Materials & Service	4
EM 440 Org. and Adm.	4
EM 450 Class. & Catalog.	4
EM 495 Practicum	1-10

ENGLISH

EH 301 Creative Writing	3
EH 302 Creative Writing	3
EH 310 Word Study	3
EH 357 Survey of Amer. Lit. or	5
EH 358 Survey of Amer. Lit.	5
EH 394 Intr. to Linguistics	5
EH 401 English Syntax	5

FAMILY AND CHILD DEVELOPMENT

FCD 207 Prenatal and Infant Dev.	3
FCD 257 Family & Human Dev.	3
FCD 307 Growth & Dev. of Children	5
FCD 327 The Child in Cul. Dis. Fam.	5
FCD 417 Guidance of Children	5
FCD 437 Learn. Exp. for Young Children	5
FCD 467 Parent Education	5
FCD 497 Internship in Agencies serving Children & Family	5

FOREIGN LANGUAGE

FL 1-1 Elementary	5
FL 1-2 Elementary	5
FL 2-1 Intermediate	5
FL 2-2 Intermediate	5
FL 3-1 Advanced	5
FL 3-2 Advanced	5
FL 4-1 Contmp. Literature	5
FL 4-2 Contmp. Literature	5

HEALTH, PE, & RECREATION

HPR 110 Health Science	3
HPR 117 Developmental Act.	2
HPR 201 History & Prin. of HPR	3
HPR 211 Sensimotor Act.	3
HPR 212 Elementary School Act.	3
HPR 213 Dance for Children	3
HPR 295 School Health	5

HPR 370 Dance Survey	3
HPR 386 Rec. Leadership	5
HPR 395 Health Inst.	3
HPR 396 Drug Use & Abuse	3
HPR 495 First Aid	3

LANGUAGE ARTS

EH 301 Creative Writing	3
EH 302 Creative Writing	3
EH 310 Word Study	3
EH 357 Survey of Amer. Literature	5
or	
EH 358 Survey of Amer. Literature	5
EH 390 Adv. Composition	5
EH 394 Linguistics	3
SP 101 Listening Improvement	1
SP 200 Survey of Bases of Speech	5
SP 201 Int. Oral Comm.	5
SP 301 Phonetics	3

MATHEMATICS

MH 159 Pre-Calculus Math w/o Trig.	5
MH 160 Pre-Calculus w. Trig.	5
MH 161 An. Geom. & Calculus	5
MH 162 An. Geom. & Calculus	5
MH 163 An. Geom. & Calculus	5
MH 247 Fnds. of Plane Geom.	3
MH 266 Topics in Linear Algebra	3
MH 267 Intr. Prob. & Statistics	5
MH 331 Intr. to Modern Algebra	5
MH 441 Geometry I	5
MH 442 Geometry II	5

MUSIC

MU 131 Mat. & Org. of Music	5
(In lieu of MU 371)	
Only 2 hrs. count on concentration since 3 hours are required on the regular program.	
MU 352 Music History II	3
MU 353 Music History III	3
EED 396 Music for Elem. Tchrs.	3
or	
EED 496 Music in Elem. School	4
MU 373 Appreciation of Music	3
MU 374 Masterpieces of Music	3
3 units from any of the following ensembles:	3
MU 221-22-23 (1)	
MU 124-25-26 (1)	
MU 224-25-26 (1)	
MU 127-28-29 (1)	

PSYCHOLOGY

PG 211 Psychology I	5
PG 212 Psychology II	3
PG 330 Social Psychology	4
PG 360 Fields of Prof. Psychology	5
PG 431 Social Psychology	5
PG 461 Industrial Psychology	5
PG 480 History of Psychology	5
or	
PG 211 Psychology I	3
PG 212 Psychology II	3
PG 215 Quant. Meth. in Psychology	4
PG 320 Experimental Psychology I	4
PG 321 Experimental Psychology II	4
PG 322 Experimental Psychology III	4

SCIENCE

PS 204 Fundamentals of Physics	5
PS 205 Introduction to Physics	5
PS 206 Introduction to Physics	5
AY 310 Earth Science	5
GL 101 Introduction Geol. I	5
GL 102 Introduction Geol. II	5
BI 102 Plant Biology	5
BI 103 Animal Biology	5
AA 304 Meteorology	5

SOCIAL SCIENCE

EC 206 Socio.-Ec. Fnd. Con.	3
EC 458 Econ. History	5
HY 201 History of U.S.	5

HY 202 History of U.S. _____	5	SC 341 Phonetics _____	3
HY 300 Intr. Lat. Amer. History _____	5	SC 460 Intr. to Audio. _____	5
HY 301 Intr. Far East History _____	5		
HY 306 Contemporary Affairs _____	5	SPEECH CORRECTION	
SY 203 Cult. Anthropology _____	5	SC 201 Speech Comm. Theo. _____	5
SY 204 Social Behavior _____	5	SC 340 Speech & Hear. Mech. _____	5
SY 207 Intr. to Archaeology _____	5	SC 341 Phonetics _____	3
SY 304 Minority Groups _____	5	SC 460 Intr. to Audiology _____	5
SY 405 Urban Sociology _____	5	SC 461 Hearing Pathology _____	5
SY 407 Public Opinion & Prop. _____	5	SC 462 Hearing Evaluation _____	5
PA 214 Intr. to Ethics _____	3	IED 476 Sur. of Except. Child _____	5
PG 211 Psychology I _____	3	SC 355 Cl. Proc. Speech _____	1-3
PO 210 Amer. State & Local Govt. _____	5	SC 365 Cl. Proc. Hearing _____	1-3
PO 328 Govt. and the Economy _____	5	SC 655 Cl. Proc. Speech _____	1-3
GY 305 Geog. of No. America _____	5	SC 665 Cl. Proc. Hearing _____	1-3
GY 404 Physical Gy. _____	5		
GY 405 Cultural Gy. _____	5	ZOOLOGY—ENTOMOLOGY	

SPEECH

SC 200 Intr. Speech Comm. _____	5
SC 201 Speech Comm. Theo. _____	5
SC 202 App. Speech Comm. _____	3
SC 220 Fund. of Oral Inter. _____	5
SC 270 Group Leadership _____	3
SC 273 Group Discussion _____	5

BI 103 Animal Biology _____	5
ZY 214 Vertic., Phys. & Anato. _____	5
ZY 300 Genetics _____	5
ZY 301 Comp. Anatomy _____	5
ZY 302 Vertebrate Embryology _____	5
ZY 304 General Entomology _____	5
ZY 310 Cell Biology _____	5
ZY 401 Invertebrate Zoology _____	5
ZY 421 Vertebrate Zoology I _____	5

3. Special Education (Mental Retardation and Behavior Disturbance)**FRESHMAN YEAR****First Quarter**

EH 101 English Comp. _____	3
HY 101 World History _____	5
or	
HY 204 Tech. and Civiliz. _____	3
SC 202 App. Sp. Comm. _____	3
BI 101 Prin. of Biology _____	5
PE 101 Fnds. of Phys. Ed. _____	1
Orientation _____	1

Second Quarter

EH 102 English Comp. _____	3
HY 102 World History _____	5
or	
HY 205 Tech. and Civiliz. _____	3
BI 104 Bio. in Human _____	5
Affairs _____	5
Approv. Soc. Sci. _____	5
Physical Education _____	1

Third Quarter

EH 103 English Comp. _____	3
HY 103 World History _____	5
or	
HY 206 Tech. and Civiliz. _____	3
PHS 100 Physical Science _____	5
Approv. Soc. Sci. _____	5
EED 104 Orient. to Lab. _____	1
Exp. _____	1
Physical Education _____	1

SOPHOMORE YEAR

PHS 101 Physical Science _____	5
SY 201 Intr. to Sociology _____	5
Approv. Literature _____	3
Approv. Math _____	5

FED 213 Hum. Gro. and _____	5
Development _____	5
IED 376 A Surv. of Except. _____	5
Approv. Lit. _____	3
Approved Elective _____	5

MU 201 Fnds. of Music _____	5
or	
MU 371 Intr. to Music _____	5
IED 377 Intr. to Mental _____	5
Retard. _____	5
or	
IED 378 Intr. to Behavior _____	5
Disturb. _____	5
Approv. Lit. _____	3
Approv. elect. _____	8

Major — Mental Retardation**JUNIOR YEAR****First Quarter**

EED 301C Curr. I: Rdg. and _____	5
Other Lang. Arts; _____	5
Music and _____	5
Related Art _____	10
FED 214 Psych. Fnds. of Ed. _____	5

Second Quarter

EED 401C Curr. II: Math _____	5
Natural and Soc. _____	5
Science _____	10
FED 320 Social Fnds. of Ed. _____	5
Elective _____	4

Third Quarter

IED 486 The Severely _____	5
Mentally Retard. _____	5
AT 342 Elem. School Art _____	5
SC 450 Prin. of Sp. Corr. _____	5
Approv. Minor _____	5

SENIOR YEAR

HRP 417 P.E. for MR _____	5
ED 437 Voc. Trng. MR _____	5
Approv. Minor _____	10

IED 425 Prof. Internship _____	5
Mental Retard. _____	15

FED 480 Phil. Fnds. of Ed. _____	5
Approv. Minor _____	10

Total — 210 quarter hours**Major — Behavior Disturbance****JUNIOR YEAR****First Quarter**

EED 301D Curr. I: Rdg. and _____	5
Other Lang. Arts; _____	5
Music and Related _____	5
Arts _____	10
FED 214 Psych. Fnd. of Ed. _____	5
PG 350 Behavior Modific. _____	5

Second Quarter

EED 401D Curr. II: Mathe- _____	5
matics Natural _____	5
and Soc. Sci. _____	10
FED 320 Soc. Fnds. of Ed. _____	5
Elective _____	2

Third Quarter

PG 435 Behavior Path. _____	4
AT 342 Elem. Sch. Art _____	5
SC 450 Prin. of Sp. _____	5
Correction _____	5
Approv. Minor _____	5

SENIOR YEAR

First Quarter

HPR 211	Sensorimotor Act.	3
IED 480	Chld. Spec. Lrn.	5
	Disability	5
	Approv. Minor	10

Second Quarter

IED 425	Prof. Internship	
	Behav. Dist.	15

Third Quarter

FED 480	Phil. Fnds. Ed.	5
	Approv. Minor	10

Total — 210 quarter hours

B. Secondary Education (SED)

FRESHMAN YEAR

First Quarter

EH 101	English Comp.	3
HY 101	World History	
	or	
HY 204	Tech. and Civiliz.	3
BI 101	Prin. of Biology	5
SC 202	App. Sp. Comm.	3
SED 103	Orientation	1
PE 101	Fnds. of P.E.	1
	Elective	1

Second Quarter

EH 102	English Comp.	3
HY 102	World History	
	or	
HY 205	Tech. and Civiliz.	3
BI 104	Bio. in Human Affairs	5
	Math Elective	5
PE 102	Beg. Swimming	
	or Gr. I	1
	Elective	1

Third Quarter

EH 103	English Comp.	3
HY 103	World History	
	or	
HY 206	Tech. and Civiliz.	3
	Phys. Sci. Elec.	5
	Soc. Sci. Elec.	5
SED 104	Orientation Lab. Ex.	1
PE	Group II	1
	Elective	1

SOPHOMORE YEAR

EH 253	Lit. in Eng.	3
SY 201	Intr. to Soc.	5
	Phys. Sci. Elec.	5
	Major-Minor	3
	Elective	1

FED 213	Human Growth & Development	5
	Major-Minor	9
	Approved Lit. Elec.	3
	Elective	1

FED 214	Psy. Fnds. of Education	5
	Major-Minor	8
	Approved Lit. Elec.	3
	Elective	1

JUNIOR YEAR

FED 320	Soc. Fnds. of Education	5
	Major-Minor (or approved elec.)	15

	Teaching in Major area of Spec.	3
	Major-Minor (or approved elec.)	15

	Teaching a Program in Major or Minor Area of Spec.	9
	Major-Minor (or approved elec.)	15

SENIOR YEAR

	Prog. in Area of Specialization	3
	Major-Minor (or approved elec.)	15

425	Professional Internship	15
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FED 480	Phil. & Historical Foundations of Ed.	5
	Major-Minor (or approved elec.)	10

Total — 210 quarter hours

C. Health, Physical Education, and Recreation (HPR)

I. Health Education

FRESHMAN YEAR

First Quarter

BI 101	Prin. of Biology	5
MH 100	Math. Insights	5
EH 101	English Comp.	3
HY 101	World History	
	or	
HY 204	Tech. & Civiliz.	3
HPR 105	Orientation	1
PE 101	Fnds. of P.E.	1

Second Quarter

BI 103	Gen. Anim. Biol.	5
PHS 151	Physical Sci. I	5
EH 102	English Comp.	3
HY 102	World History	
	or	
HY 205	Tech. and Civiliz.	3
PE 102	Beg. Swimming	
	or Gr. I	1

Third Quarter

PHS 152	Physical Sci. II	5
HPR 110	Health Science	3
EH 103	English Comp.	3
HY 103	World History	
	or	
HY 206	Tech. and Civiliz.	3
HPR 108	Orientation Lab.	
	Experience	1
PE	Group II	1

SOPHOMORE YEAR

VM 220	Anatomy and Phys.	5
FED 213	Human Development	5
	Appr. Soc. Sci.	5
EH 253	English Lit.	3

VM 221	Anatomy and Phys.	5
FED 214	Psych. Found. Ed.	5
SY 201	Int. to Sociology	5
EH	Approved Lit.	3

SY 220	Statistics	5
NF 119	Nutrition and Man	3
EH	Approved Lit.	3
HPR 295	School-Com. Health	3
SC 202	App. Sp. Comm.	3

First Quarter

FED 320 Soc. Found. Educ.	5
Appr. Biol. Sci.	5
HPR 395 Health	3
Instruction	3
NF 353 Com.-Family Health	3
Elective	3

JUNIOR YEAR**Second Quarter**

HPR 429 Health	3
Observation	5
EH 141 Medical Vocabulary	3
HPR 302 Drug Use & Abuse	3
HPR 423A Program in	3
H. Ed.	3
Appr. H. Ed.	3

Third Quarter

VM 311 Gen. Bacteriology	5
Appr. Biol. Sci.	5
SED T or P (minor)	3
HPR 414A Teaching in	3
H. Ed.	3
HPR 403 First Aid	3

SENIOR YEAR

PY 428 Public Health	5
Appr. Biol. Sci.	5
Appr. Health Ed.	5
Elective	3
HPR 425 Prof. Internship	15
FED 480 Phil. Fnds. Ed.	5
IED 476 Exceptional Child	5
Appr. Health Ed.	5
Elective	3

Total — 210 quarter hours

2. Health and Physical Education**FRESHMAN YEAR****First Quarter**

EH 101 English Comp.	3
HY 101 World History	3
or	
HY 204 Tech. and Civiliz.	3
BI 101 Prin. of Biol.	5
HPR Theory & Tech.	2
HPR 105 Orientation	1
PE 101 Fnds. of Phys. Ed.	1

Second Quarter

EH 102 English Comp.	3
HY 102 World History	3
or	
HY 205 Tech. and Civiliz.	3
PHS 151 Phys. Sci. or Phys.	5
Sci. elective	5
MH 100 Math. Insights or	
MH 159 (Pre Cal. w/o	
Trig.) or MH 160	
(Algebra w. Trig.)	5
PE 102 Beg. Swimming or	
Group I	1

Third Quarter

EH 103 English Comp.	3
HY 103 World History	3
or	
HY 206 Tech. and Civiliz.	3
HPR 195 Health Sci.	3
HPR 108 Orientation to Lab.	1
Exp.	1
HPR Theory & Tech.	2
VM 220 Anatomy &	
Physiology	5
PE Group II	1

SOPHOMORE YEAR

VM 221 Anat. & Physio.	5
FED 213 Human Develop.	5
HPR 212 Elem. Sch. Act.	3
HPR Theory & Tech.	2
EH 253 Lit. in Eng.	3
PE Approved P.E.	1

FED 214 Psych. Fnds. of Ed.	5
SY 201 Intr. to Soc.	5
Approved Lit.	
Elective	3
Social Science	
Elective	5
PE Approved P.E.	1

SC 202 App. Sp. Comm.	3
Social Sci. Elective	5
PS 204 Physics	5
HPR Theory & Tech.	2
PE Approved P.E.	1
HPR 201 History and	
Prin. of HPR	3

JUNIOR YEAR

HPR 295 Sch. Comm.	3
Health	3
FED 320 Soc. Fnd. of	
Education	5
Minor	10

HPR Teach. & Coach.	3
HPR 385 Princ. of Rec.	3
HPR 316 Evaluation in HPR	3
Approved Lit.	
Elective	3
Approved Elective	2
Minor	5

HPR 423B Prog. HPE	3
HPR 395 Health Instr.	3
HPR 315 Kinesiology	3
HPR 405 Physio. of	
Musc. Act.	5
Minor	5

SENIOR YEAR

HPR 401 Org. & Admin.	5
in HPR	5
HPR 414B Teach. HPE	3
Teach. or Program	3
Minor	3
Minor	5

HPR 425B Prof. Intern	15
in HPE	

FED 480 Phil. Fnds.	
of Educ.	5
HPR Approved Elect.	
in Health or	
Phys. Educ.	5
Minor	5
Approved Elective	3

Total — 210 quarter hours

3. Recreation Administration**FRESHMAN YEAR****First Quarter**

BI 101 Prin. of Biol.	5
EH 101 English Comp.	3
HY 101 World History	3
or	
HY 204 Tech. and Civiliz.	3
PE 101 Fnds. of Phys. Ed.	1
HPR 195 Health Science	3
Electives	3

Second Quarter

BI 102 or 103	5
EH 102 English Comp.	3
HY 102 World History	3
or	
HY 205 Tech. and Civiliz.	3
MH 100 Math. Insights	5
PE 102 or Group I	1
HPR 105 Orientation	1

Third Quarter

PG 211 Psychol. I or FED	
213 Hum. Growth &	
Dev.	3.5
EH 103 English Comp.	3
HY 103 World History	3
or	
HY 206 Tech. and Civiliz.	3
HPR 108 Orientation to Lab.	
Exp.	1
HPR Theory & Tech.	2
PE Group II	1
Elective	4

SOPHOMORE YEAR

First Quarter

EH 253 Lit. in Eng.	3
EC 200 Economics I	5
HPR Theory & Tech.	2
HPR 201 Hist. & Prin.	3

Second Quarter

SY 204 Social Behavior	5
PO 209 Intr. to Am. Govt.	5
Phys. Science	5
Elective	3

Third Quarter

EH Lit. Elective	5
SC 202 App. Sp. Comm.	5
JM 221 Beg. News Writing	5
Physical Sci.	5
HPR Theory & Tech.	2
PE 165 Camping	1

JUNIOR YEAR

HPR 385 Prin. of Rec.	3
HPR 386 Rec. Leadership	3
HPR 316 Evaluation	3
EH Lit. Elective	3
Minor	5

HPR 388 Camp Management	3
FL 303 Forest Rec.	3
PO 325 Intr. to Public Admin.	5
Minor	5
Elective	3

HPR 387 Outdoor Rec.	3
HPR 495 First Aid	3
TH 307 Child Theatre	3
HPR Teach. & Coach.	3
Minor	5

SENIOR YEAR

PE 166 Family Rec.	1
HPR 401 O & A of HPR	5
HPR 485 Social Rec.	3
HPR 423C Program Rec.	3
Minor	5

HPR 425C Prof. Intern	15
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SY 405 Urban Socio.	5
CA 145 Creative Crafts	2
Minor	10

Total — 210 quarter hours

D. Vocational and Adult Education (VED)

FRESHMAN YEAR

First Quarter

HY 101 World History	or
HY 204 Tech. and Civiliz.	3
EH 101 English Comp.	3
BI 101 Prin. of Biology	5
VED 103 Freshman Orient.	1
PE 101 Fnds. of P.E.	1
Approved Elective	2

Second Quarter

HY 102 World History	or
HY 205 Tech. and Civiliz.	3
EH 102 English Comp.	3
BI 102 Gen. Plant Biol.	****
or	
BI 103 Gen. Anim. Biol.	or
BI 104 Biol. in Hum. Affairs	5
PE 102 Beg. Swimming	or Gr. I
SC 202 App. Sp. Comm.	3
Approved Elective	1

Third Quarter

HY 103 World History	or
HY 206 Tech. and Civiliz.	3
EH 103 English Comp.	3
VED 104 Orientation to Lab. Experiences	1
PE Group II	1
Approved Physical Science	Elect.†
Approved Math.	5
Approved Elective	1

SOPHOMORE YEAR

SY 201 Intr. to Socio.	5
Literature Elective	3
Approved Physical Sci.†	5
Approved Elective	6

EC 200 Economics I*	5
FED 213 Human Develop.	5
Lit. Elective	3
EH 345 Bus. & Prof. Writ.**	5
EH 304 Tech. Writ.***	3
JM 315 Ag. Journal****	3
Approved Elective	1

FED 214 Ed. Psychology	5
VED 346 Voc. & Adult Ed.	3
Approved Soc. Sci. Elective	5
Literature Elec.	3
Approved Elec.	1

*ADS 202 for Agricultural Education majors.

**Rehabilitation Services majors.

***Industrial Arts, Distributive Educ., and Trade and Industries majors.

****Agricultural Education majors.

†CH 103 and CH 104 for Agricultural Education majors.

1. Adult Education

JUNIOR YEAR

Second Quarter

VED 413 Nat. of Adult Education	5
Approved Subj. Matter Electives**	9
FED 320 Soc. Fnds. of Education	5

VED 414 Prog. in Adult Education	5
Approved Subj. Matter Electives**	10
VED 410 Occup. Infor.	3

Third Quarter

VED 415 Tch. in Adult Education	3
VED 456 Lrng. Resources in Adult Ed.	3
Approved Subj. Matter Electives**	13

SENIOR YEAR

VED 466 Educ. Activities for Adult Gps.	3
Approved Subj. Matter Electives**	15

VED 425 Professional Internship in Adult Educ.	15
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FED 480 Phil. Fnds. of Education	5
VED 491 Probs. in Tchng. Adults	3
Approved Subj. Matter Electives**	10

Total — 210 quarter hours

*A minor in Adult Education may be earned by completing VED 413, VED 414, VED 466, and VED 491 plus approved electives for a total of 24 hours.

**Approved electives in not more than two subject matter fields of concentration.

2. Agricultural Education

(a) General Agricultural Education

JUNIOR YEAR

First Quarter

HF 221 Landscp. Gardening	5
ADS 200 Intr. to An. & Dairy Sci.	5
AN 352 Tractor & Engine Tech.	5
FED 320 Soc. Fd. of Ed.	5

Second Quarter

AS 301 Agric. Marketing	5
AY 307 General Soils	5
VED 414A Prog. in Ag. Ed.	3
VED 456A Learning Resources-Ag. Ed.	3

Third Quarter

VED 410 Occp. Information	3
VED 415A Teaching in Ag. Ed.	3
VED 406 Pract. in Bldg. Const. & Maint.	5
Approved Agronomy Elective	5

SENIOR YEAR

VED 466 Teac. Out of School Groups	3
VED 404 Pract. in Gen. Metals	5
Approved An., Poul. or Dairy Sc. Elec.	5
AS 401 Farm Management	5

VED 425A Profes. Internship in Ag. Ed.	15
--	----

FED 480 Phil. Fd. of Ed.	5
ZY 402 Econ. Entomology	5
Approved Ag. Engin. Elec.	5
Approved Horticulture Elec.	5

Total — 210 quarter hours

APPROVED ELECTIVES

AS 410 Agricultural Business Management	
AS 411 Economic Development Of Rural Resources	
AN 350 Soil and Water Technology	
AN 351 Agricultural Machinery Technology	
AN 352 Tractor and Engine Technology	
AY 201 Grain Crops	
AY 401 Forage Crops	

AY 414 Principles & Use of Herbicides in Crop Production	
ADS 204 Animal Biochemistry & Nutrition	
ADS 302 Feeds and Feeding	
ADS 303 Livestock Production	
ADS 200 Fundamentals of Dairying	
FY 313 Farm Forestry	
HF 224 Plant Propagation	

HF 323 Greenhouse Const. & Management	
HF 201 Orchard Mgtment.	
HF 308 Vegetable Crops	
PH 301 General Poultry Husbandry	
VED 246 Instructional Drawing	
VED 405 The School Shop	
VED 407 Practicum in Electricity	

(b) Technical Agricultural Education

JUNIOR YEAR

First Quarter

ADS 200 Intr. to An. & Dairy Sc.	5
FED 320 Social Fd. of Ed.	5
HF 221 Landscape Garden.	5
AN 352 Tractor & Engine Tech.	5

Second Quarter

AS 301 Ag. Market.	5
VED 414 Program in Ag. Ed.	3
VED 456A Learning Res. in Ag. Ed.	3
Approved Electives in Tech.-Ag. Concentrat.	10

Third Quarter

VED 410 Occup. Inform.	3
VED 415A Teach. in Ag. Ed.	3
AY 307 General Soils	5
Approved Elective in Tech. Ag. Concentrat.	10

SENIOR YEAR

VED 404 Pract. in Gen. Metals	5
VED 466 Teac. Out of School Groups	3
AS 401 Farm Management	5
VED 406 Pract. in Bldg. Const.	5

VED 425A Profess. Internship in Ag. Ed.	15
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FED 480 Philosophical Fd. of Education	5
ZY 402 Econ. Entomology	5
Approved Electives in Tech. Ag. Concentrat.	10

Total — 210 quarter hours

Students declaring a technical agricultural concentration must plan the selection of these courses in consultation with their adviser and representatives of the supporting department. This will ensure that established prerequisites are met and that the plan of study contributes most effectively to student objectives and occupational requirements.

3. Basic Vocational Education

JUNIOR YEAR

First Quarter

Major Electives	10
Minor Electives	3
FED 320 Soc. Found. of Education	5

Second Quarter

VED 414 Program in Basic VED (Major)	3
Major Elective	5
Minor Elective	5
VED 410 Occup. Infor.	3

Third Quarter

VED 415 Teaching in Basic VED	3
VED 456 Learning Resources in VED	3
Major Elective	7
Minor Elective	5

SENIOR YEAR

First Quarter

VED 423 Program in Basic	
VED (Minor)	3
Major Electives	15

Second Quarter

VED 425 Professional Internship in Basic	
VED	15

Third Quarter

FED 480 Phil. Found. of Education	5
Major Elective	5
Minor Electives	8

Total — 210 quarter hours

NOTE: See pages 146-47 for the listing of approved major and minor electives in the basic vocational specialization fields of agriculture, building construction, distributive business, metals technology and power mechanics.

4. Business Education*

(a) General Business**

First Quarter

FED 320 Soc. Found. of Ed.	5
ACF 312 Inter. Acct.	5
MN 310 Prin. of Mgt.	5
MN 305 Records Mgt.	3

JUNIOR YEAR

Second Quarter

MN 341 Business Law	5
EH 345 Bus. & Prof. Writ.	5
Electives	8

Third Quarter

VED 414 Prog. in Bus. Ed.	3
MT 331 Prin. of Mkt.	5
MN 207 El. Data Proc.	5
Electives	5

SENIOR YEAR

VED 415 Teaching Bus. Ed.	3
MN 400 Office Machines	5
Approved Phy. Sci.	5
Electives	5

VED 425 Internship	15
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FED 480 Phil. Fnd. Ed.	5
MN 405 Admin. Mgt.	5
Teaching or Program in Minor	3
Approved Phy. Sci.	5

Total — 210 quarter hours

(b) Office Administration**

First Quarter

FED 320 Soc. Found. of Ed.	5
MN 300 Transcription I	5
EC 200 Economics I	5
MN 305 Records Mgt.	3

JUNIOR YEAR

Second Quarter

MN 341 Business Law	5
MN 400 Office Machines	5
EC 202 Economics II	5
Electives	3

Third Quarter

VED 414 Program in Bus. Ed.	3
MN 310 Prin. of Mgt.	5
MN 207 El. Data Proc.	5
Electives	5

SENIOR YEAR

VED 415 Teaching Bus. Ed.	3
MN 403 Secretarial Adm.	5
Approved Phy. Sci.	5
Electives	5

VED 425 Internship	15
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FED 480 Phil. Fnds. Ed.	5
Approved Phy. Sci.	5
Teaching or Prog. in Minor	3
Electives	5

Total — 210 quarter hours

(c) Business Management (Composite Major/Minor)

First Quarter

FED 320 Soc. Fnds. Ed.	5
ACF 312 Inter. Acct.	5
MN 310 Prin. of Mgt.	5
MN 305 Records Mgt.	3

JUNIOR YEAR

Second Quarter

MN 341 Business Law	5
EC 360 Money & Banking	5
EH 345 Bus. & Prof. Writ.	5
ACF 340 Personal Fin. or	
MN 447 Job. Eval.	3

Third Quarter

VED 414 Program in Bus. Ed.	3
MN 207 E. Data Proc.	5
EC 350 Labor Economics	5
MN 342 Business Law	5

SENIOR YEAR

VED 415 Teaching Bus. Ed.	3
MN 455 Gov't. & Business	5
MN 400 Office Machines	5
Approved Phy. Sci.	5

VED 425 Internship	15
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FED 480 Phil. Fnds. Ed.	5
Approved Phy. Sci.	5
Elective	8

Total — 210 quarter hours

(d) Management Services (Composite Major/Minor)

JUNIOR YEAR

First Quarter

FED 320 Soc. Fnd. of Ed.	5
MN 300 Transcription I	5
EC 200 Economics I	5
MN 305 Records Mgt.	3

Second Quarter

MN 341 Business Law	5
MN 400 Office Machines	5
EC 202 Economics II	5
ACF 340 Personal Fin.	3

Third Quarter

VED 414 Program in Bus. Ed.	3
MN 310 Prin. of Mgt.	5
MN 207 El. Data Proc.	5
EC 360 Money & Banking	5

SENIOR YEAR

VED 415 Teaching Bus. Ed.	3
MN 403 Secretarial Proc.	5
Approved Phy Sci.	5
Electives	5

VED 425 Internship	15
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FED 480 Phil. Fnds. Ed.	5
MN 455 Gov't. & Business	5
Approved Phy. Sci.	5
Elective	3

Total — 210 quarter hours

*In each of the 4 curricula in business education MN 200, 201, and 202 should be included in the freshman year. EC 200 and 202 should be taken during the sophomore year in Curricula *a* and *c* and will become part of the general education social science requirement. Curricula *a* and *c* require ACF 211 and 212 during the sophomore year, whereas Curricula *b* and *d* require MN 210, 211, and 212.

**Programs (a) and (b) require a minor. In these programs a total of 24 quarter hours are available for use toward meeting requirements of an elected teaching minor.

5. Distributive Education

JUNIOR YEAR

First Quarter

MT 331 Prin. of Marketing	5
MT 333 Salesmanship	3
FED 320 Soc. Found. of Education	5
EC 274 Bus. Econ. Stat. I	5

Second Quarter

VED 414 Prog. in Dist. Education	5
MT 432 Advertising	3
MT 433 Retail Store Mgt.	5
HE 355 Consumer Textiles	3
VED 410 Occup. Infor.	3

Third Quarter

VED 415 Teaching in Dist. Education	3
VED 456 Learning Res. in Dist. Educ.	3
MT 434 Purchasing	5
EC 350 Labor Problems	5

SENIOR YEAR

VED 466 Teaching Out-of-Sch. Groups	3
MT 435 Marketing Probs.	5
MT 438 Retail Merchandising	5
VED 458 Coord. & Supervision in VED	3
Electives	3

VED 425 Professional Internship in Dist. Educ.	15
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FED 480 Phil. Fnds. of Education	5
MN 442 Personnel Mgt.	5
VED 462 Directed Work Experience	5
Electives	3

Total — 210 quarter hours

NOTE: Electives to be taken in Adult Education, Psychology, Sociology or in other subject-matter areas which will aid the student in teaching Distributive Education in the high school, at post-secondary level, and adult programs.

6. Industrial Arts

JUNIOR YEAR

First Quarter

FED 320 Soc. Fnds. of Education	5
Major-Minor	15

Second Quarter

VED 410 Occup. Info.	3
VED 414 Prog. in Ind. Arts	3
Major-Minor	15

Third Quarter

VED 415 Teach. in Ind. Arts	3
VED 456 Learning Res. in Ind. Arts	3
Major-Minor	13

SENIOR YEAR

VED 466 Teach. Out-of-School Groups	3
Major-Minor	15

VED 425 Prof. Internship in Ind. Arts	15
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FED 480 Phil. Fnds. of Ed.	5
Major-Minor	12

Total — 210 quarter hours

NOTE: See page 149 for the listing of approved composite major-minor in Industrial Arts.

7. Rehabilitation Services Education

JUNIOR YEAR			Third Quarter		
First Quarter			Second Quarter		
PG 212 Intr. to Psy. II	3	VED 414 Prog. in Trade & Ind. Education	3	VED 415 Teaching in Rehabilitation	3
SY 305 Culture and Personality	3	EC 350 Labor Economics	5	VED 456 Learning Res. in Rehabilitation	3
Selected Electives	4	VED 476 Trade & Ind. Exp.	5	VM 210 Human Physiology	5
FED 320 Soc. Fnds. of Education	5	VED 410 Occup. Info.	3	Selected Electives	7
SENIOR YEAR					
VED 466 Teaching Out-of-Sch. Groups	3	VED 425 Professional Internship in Rehabilitation	15	FED 480 Phil. Fnds. of Education	5
VED 435 Voc. Eval. in Rehabilitation	5			SP 273 Group Problem Solving	5
AED 421 Guidance in Public Schools	5			Selected Electives	10
Selected Electives	5				

Total — 210 quarter hours

NOTE: Rehabilitation majors required to take minimum of 25 elective hours in a selected area of special interest.

8. Trade and Industrial Education

JUNIOR YEAR			Third Quarter		
First Quarter			Second Quarter		
VED 475 Trade & Teach. Experience*	5	VED 414 Prog. in Trade & Ind. Education	3	VED 415 Teaching in Trade & Ind. Education	3
EH 345 Business & Prof. Writing	5	EC 350 Labor Economics	5	VED 456 Learn. Res. in Trade & Ind. Education	3
MN 310 Business Organ. & Mgt.	5	VED 476 Trade & Ind. Exp.	5	VED 477 Trade & Ind. Exp.	5
FED 320 Soc. Fnds. of Educ.	5	VED 410 Occup. Info.	3	MT 331 Principles of Marketing	5
SENIOR YEAR					
First Quarter			Second Quarter		
VED 466 Teaching Out-of-Sch. Groups	3	VED 425 Professional Internship in Trade & Ind. Ed.	15	FED 480 Phil. Fnds. of Education	5
VED 474 Org. of Inst. in T. & I.	5	VED 479 Trade & Ind. Experience	5	VED 480 Trade & Ind. Experience	5
VED 478 Trade & Ind. Experience	5			VED 246 Inst. Drawing	3
VED 458 Coord. & Supr. in VED	3			VED 441 Develop. of Voc. Education	4

Total — 210 quarter hours

*Credit for VED 475-480 (inc.) (5-5-5-5-5-5) by supervised employment or by examination on basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to starting the curriculum, elective coursework may be substituted for these credits. Time required to complete curriculum would be reduced accordingly.

9. Vocational Home Economics Education

FRESHMAN YEAR			Third Quarter		
First Quarter			Second Quarter		
NF 104 Prin. Food Prep.	5	NF 112 Nut. and Man	3	SC 202 App. Sp. Comm.	3
EH 101 English Comp.	3	CA 116 Art. Everyday Liv.	3	CA 115 Clo. and Man	3
HY 101 World History	3	EH 102 English Comp.	3	EH 103 Eng. Comp.	3
BI 101 Prin. of Biology	5	HY 102 World History	3	HY 103 World History	3
VED 103 Orientation	1	BI 104 Bi. Human Af.	5	MH Approved Math.	5
PE 101 Fnds. of Phys. Ed.	1	PE 102 or Group I	1	PE Group II	1
		FED 110 Cont. Home Ec.	1	VED 104 Intr. to Lab. Exp.	1
SOPHOMORE YEAR					
CA 105 Fnds. of Cloth.	5	NF 204 Meal Mgt.	5	CA 113 Housing for Man	3
FED 213 Human Develop.	5	FED 214 Psy. Fnds. of Ed.	5	Phy. Sci. Elec.	5
SY 201 Intr. to Sociology	5	Soc. Sci. Elec.	5	Soc. Sci. Elec.	5
EH Literature Elec.	3	EH Lit. Elec.	3	EH Lit. Ed.	3

JUNIOR YEAR**First Quarter**

FED 320 Soc. Fnds. of Ed.	5
CA 205 Clo. for Family	3
HF 225 Flower Arrang.	3
Physical Science	5

Second Quarter

FCD 307 Prin. Child Dev.	5
FCD 323 Mgnt. Mod. Liv.	3
FCD 257 Fam. & Hum. Dev. ..	3
Minor	5
App. Home. Ec. El.	3

Third Quarter

CA 343 Int. Home Prob. or Gr. Elec.	5
Approved Elec.	3
Minor	10

SENIOR YEAR

VED 411 Tchg. Home Ec.	5
VED 412 Prog. Home Ec.	4
CA 206 Garment Stru.	3
Minor	5

VED 425 Prof. Internship	15
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FED 480 Phil. Fnds. Ed.	5
FCD 443 Home Mgt. Res.	5
FCD 457 Family Rel.	5
CA 431 Man Env. Rel.	2

Total — 210 quarter hours

School of Engineering

J. GRADY COX, *Dean*

CHARLES H. HOLMES, *Assistant Dean*

The Profession

THE ENGINEERING PROFESSION applies a knowledge of the mathematical and natural sciences in developing ways to utilize the materials and forces of nature for the benefit of mankind. The various curricula in engineering prepare the students to work and serve in this profession. It is largely through the efforts of the engineer that it is now possible for our American civilization to consider the elimination of want and the protection and conservation of our environment.

Liberal Education

As a professional man the engineer must have a broad general education so that he may take his place not only in the technical councils of American citizenry, but in social and political councils as well. It is essential, therefore, that he have a truly liberal education and the engineering curricula are designed with this objective in mind.

Admission Requirements

As indicated above, the requirements for a good liberal education necessitate high school preparatory work of high intellectual quality and of considerable breadth. For admission to the curriculum in Pre-Engineering, graduation from an approved secondary school with a minimum of 16 units, or the equivalent as shown by examination, is required. The following program is recommended as *minimum* preparation for a college engineering education: English, four units; mathematics (including algebra, geometry, trigonometry, and analytic geometry); chemistry, one unit; mechanical drawing, one unit; history, literature, social science, two or three units. Physics and foreign languages are recommended but are not required for admission.

The ability to communicate with his fellow man is absolutely essential to the engineer. The secondary school student needs four years of English in order to gain the ability to read, write, speak, and listen with precision, facility, clarity, and understanding. The achievements of engineering have made possible communication and travel throughout the world which in reality have brought all countries closer together. All educated Americans and particularly engineers should recognize this fact and prepare for it by studying at least one foreign language as early as possible—even in elementary school or junior high school. The study of at least one foreign language (including the classical languages) for a minimum of two years in secondary school is highly recommended but not required for admission.

Mathematics and the sciences are the fundamentals upon which the profession of engineering is built. The prospective engineering student must acquire the best possible background of mathematics in elementary school, junior high, and high school. The emphasis should be on algebra, geometry, trigonometry, and analytic geometry so that a student entering engineering school will be able to start with analytic geometry and calculus. Mathematics courses should be deep and rigorous and preferably of modern design. One year of chemistry is required, and a year of physics is highly desirable. Biology is advantageous but should not be selected in preference to either physics or chemistry. Science courses should stress concepts and methods of science rather than the wonders of science.

The prospective engineer is educated not for engineering alone but also for becoming an adult member of society. This requires an understanding of society, its culture, and its origin; such an understanding can be gained partially by the study of literature, history, economics, the arts, and other branches of humanities and social sciences. Preparatory courses of high intellectual quality in these areas are necessary for all candidates for university-level education.

Applicants are admitted to curricula in the School of Engineering by the Engineering Admissions Committee after satisfactory performance in the appropriate freshman program. Applicants for admission to Aerospace, Chemical, Civil, Electrical, Industrial, Materials, Mechanical, and Textile Engineering, as well as Textile Chemistry, will be approved upon completion with satisfactory grades of prescribed courses in mathematics through MH 162; English Composition, nine hours; chemistry, ten hours; Graphical Methods, two hours; Introduction to Manufacturing Processes, two hours; and physical education, three hours. Admission to Aviation Management and Textile Management will be approved upon satisfactory completion of 48 quarter hours of work including all prescribed freshman work in English, mathematics, physical education, technical services, and chemistry. *A student who has not proceeded from Pre-Engineering to his field of major interest in the School of Engineering after the completion of six quarters may continue to register in Pre-Engineering only by special permission of the Dean of Engineering.*

Engineering Curricula. — Curricula offered are designed to meet the educational requirements of the engineering professions. The program in the fundamental sciences of mathematics, chemistry, and physics is followed by a study of basic engineering sciences. Specialized or departmental courses follow in the third and fourth years. A parallel program emphasizing the humanistic-social studies, including history, literature, economics, philosophy and similar courses is followed throughout the four years having as its objective a good general education for the engineering student.

Curricula accredited by the Engineers' Council for Professional Development lead to the degrees of Bachelor of Aerospace Engineering, Bachelor of Chemical Engineering, Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Industrial Engineering, and Bachelor of Mechanical Engineering. An accredited curriculum in Agricultural Engineering is offered by the School of Agriculture.

A curriculum in Materials Engineering leads to the degree of Bachelor of Materials Engineering. This curriculum is administered through the Department of Mechanical Engineering.

A curriculum in Textile Engineering leads to the degree of Bachelor of Textile Engineering. A curriculum in Textile Chemistry leads to the degree of Bachelor of Textile Chemistry. This latter curriculum is designed to train students in the chemistry of man-made fibers and in the theory and practice of textile dyeing and finishing.

Flexibility is provided in all degree programs through electives and substitutions. It is possible for the individual student, with the permission of the Head of his major department, to use this flexibility to emphasize areas of his own interest which may not be suggested by the titles of the various degrees.

Management Curricula.—Two management curricula leading to the degrees of Bachelor of Aviation Management and Bachelor of Textile Management prepare young men and women for a wide range of administrative and managerial positions in industry. The program of study in the freshman year provides a period of orientation, guidance, and selection. Freshmen are registered in the Pre-Engineering Program as Pre-Engineering Management students, and are admitted to management curricula upon successful completion of the freshman program as outlined above.

Military Training. — *All curricula in the School of Engineering permit a total requirement of six hours of basic military training. At his option, the student may choose electives in lieu of this requirement in consultation with the Assistants to the Dean or his Department Head. Three to six hours of Advanced military training may be substituted for certain electives in a curriculum. For these options, see the specific curriculum.*

Graduate Degrees. — Master of Science degrees are offered in the areas of Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. The degree Master of Electrical Engineering, a non-thesis degree, is offered by the Electrical Engineering Department. The Doctor of Philosophy degree is offered in the areas of Aerospace Engineering, Electrical Engineering, and Mechanical Engineering. For requirements for these degrees, see the Graduate School Bulletin.

Service Department. — *The Technical Services Department is a service department of the School of Engineering, offering courses in graphical methods, industrial laboratories, manufacturing processes, etc. The courses offered in this department may also be taken by students in other schools who may find them useful in their particular fields. The Technical Services Department in cooperation with the School of Education, offers a program for the professional and technical training of Industrial Arts teachers for elementary and secondary schools. (See School of Education for major and minor requirements.)*

Co-operative Education Program. — The Co-operative Education Program is offered in all curricula of the School of Engineering. Refer to page 47 for a brief description of the program and write to the Director, Co-operative Education, Auburn University, Auburn, Alabama 36830, for a booklet which gives additional information.

Engineering Extension Service. — The Engineering Extension Service helps to extend the resources of the School of Engineering to the people, businesses, and industries of the state. Most of the programs of this expanding service take the form of short courses, conferences, clinics, and seminars. For further infor-

mation, write to the Assistant Director, Engineering Extension Service, 107 Ramsay Hall.

Pre-Engineering

CHARLES M. GRIFFIN, *Assistant to the Dean for Pre-Engineering*

The Pre-Engineering Program consists of a freshman program of studies to prepare students for admission to the School of Engineering with sophomore standing. This program is designated Pre-Engineering Management (PNM) for students in the management curricula, Pre-Chemical Engineering (PCN) for students in the Chemical Engineering curriculum, and Pre-Engineering (PN) for all other curricula.

The freshman Pre-Engineering curriculum shown below is uniform for seven Engineering curricula: namely, Aerospace, Civil, Electrical, Industrial, Materials, Mechanical, and Textile Engineering. It and the Pre-Chemical Engineering curriculum are both designed for students whose high school records and ACT or College Board (SAT) scores indicate that they are capable of being successful in Mathematics 161, Chemistry 103, and Technical Services 106 during their first quarter in school. *Students required to schedule courses below these levels in mathematics, chemistry, or mechanical drawing are expected to plan, with the assistance of the Assistant to the Dean for Pre-Engineering, a program of work depending upon their aptitude and extent of high school preparation.*

A student who has not proceeded from Pre-Engineering to his field of major interest in the School of Engineering after the completion of six quarters may continue to register in Pre-Engineering only by special permission of the Dean of Engineering. Furthermore, Junior standing cannot be granted to any student in the Pre-Engineering Program regardless of the number of hours completed.

Three-Quarter Pre-Engineering Curriculum

First Quarter	Second Quarter	Third Quarter
MH 161 An. Geom. & Cal. —5	MH 162 An. Geom. & Cal. —5	MH 163 An. Geom. & Cal. —5
*CH 103 Found. of Chemistry I —4	CH 104 Found. of Chemistry II —4	PS 220 Gen. Physics I —4
CH 103L Gen. Chem. Lab. —1	CH 104L Gen. Chem. Lab. —1	EH 103 English Comp. —3
EH 101 English Comp. —3	EH 102 English Comp. —3	HY 101 World History or
**TS 106 Graphical Meth. —2	TS 100 Intr. to Mfg. Proc. —2	HY 204 Techn. and Civiliz. —3
Basic ROTC or Elect. —1	Basic ROTC or Elect. —1	Basic ROTC or Elect. —1
***PE Physical Education —1	PE Physical Education —1	PE Physical Education —1

*Students whose composite ACT scores are lower than 25 or whose total SAT scores are less than 1130 are enrolled in CH 101, followed by CH 102 with CH 103 laboratory, followed by CH 104 with CH 104 laboratory.

**Students who have not had at least one year of mechanical drawing in senior high school must complete TS 102 before scheduling TS 106.

***Physical Education: See Page 291 for PE courses.

Auburn School of Aviation

ROBERT G. PITTS, *Director*

GARY W. KITELEY, *Associate Director and Airport Manager*

HAROLD F. GOFF, *Supervisor of Flight Education*

The Auburn School of Aviation was established in 1942 as a department of the School of Engineering to offer flight education for resident and extension students of the University, for the Armed Forces, and for the general public; and to serve the citizens of Alabama and the Southern Region by providing other services in the broad field of aviation. The School cooperates

fully with the Federal Aviation Administration and other organizations in conducting special aviation research and education programs. At the present time flight courses are offered for private, commercial, multi-engine, instrument and flight instructor pilot certificates. These and several other courses in flight are offered for credit in the Aviation Management Curriculum, and are also available on a non-credit basis.

In addition to flight education, other services such as airplane storage, servicing, maintenance, and repair are provided at the airport. The school also provides air transportation anywhere in the United States for University faculty and staff. In conjunction with the Aerospace Engineering Laboratories located on the campus, the airport serves as an excellent laboratory of practical training for students enrolled in the curricula of Aviation Management and Aerospace Engineering.

The University is exceptionally well equipped to conduct these programs inasmuch as it owns a 375 acre airport, conveniently located within three miles of the campus. The landing field has two lighted paved runways 4,000 feet long. Other facilities include a two-story Administration Building, two large hangars, and a five unit T-hangar. The school currently operates ten single engine aircraft, two twin engine aircraft and two flight simulators.

Because of the excellent aviation facilities, the Auburn School of Aviation has been fully certified by the Federal Aviation Administration as an Approved Ground and Flight School with examining authority for private pilots. The Director of the Auburn School of Aviation is an Aircraft Inspection Representative and the Associate Director is a Pilot Examiner, both designated by the Federal Aviation Administration.

Curricula in Engineering

Humanistic-Social Studies. — The engineer must be more than a specialist. If he is to function effectively in his profession for the benefit of society, he must be aware of the social and humanistic implications of his activities and be equipped to assume his responsibilities in these areas. To assist him in this preparation, the various engineering curricula are arranged so that a student will take approximately 30 quarter-credit hours of humanistic-social studies. Some of the courses are prescribed while others must be selected by the student from an approved list. In addition to the specified courses in English Composition and World History, *the University requires that the student take at least one course from the area of Humanities and one course from the area of Social Sciences.* The courses are either prescribed, elective, or a combination, depending upon the specific engineering curriculum. *The Humanistic-Social Electives shall be selected from meaningful sequences, whenever possible,* the details of such approved sequences and courses being available in the offices of the Assistants to the Dean and the Department Heads. Other sequences may be elected with the approval of the Student's Department Head. A variety of sequences in the Humanities and the Social Sciences are available in the areas listed below:

Humanities

Fine Arts
History

Literature
Philosophy

Social Sciences

Anthropology
Economics
Political Science

Psychology
Psychology — Sociology
Sociology

Department of Aerospace Engineering

The curriculum in Aerospace Engineering provides an excellent educational background for those wishing to enter many areas of today's scientific and technological fields. The first two years of study are devoted to the basic subjects of mathematics, physics, and mechanics. The last two years of the curriculum deal with such areas as aerodynamics, design, astrodynamics, propulsion, structures, and flight dynamics. In support of these areas, courses in advanced mathematics, computer programming (both digital and analog), and systems analysis are offered. The methods of systematic problem analysis are stressed. The theory learned in classroom lectures is experimentally verified in laboratory sessions. During the senior year students may take technical electives in several fields of specialization. The Aerospace Engineering Curriculum also serves as an excellent background for graduate study and research.

Curriculum in Aerospace Engineering (AE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 167)

SOPHOMORE YEAR

First Quarter

MH 264	An. Geom. & Cal.	5
PS 221	General Physics II	4
ME 205	Applied Mechanics-Statics	4
AE 203	Aerospace Fundamentals	3
Basic ROTC or Elect.		1

Second Quarter

MH 265	Diff. Equat.	3
PS 222	General Physics III	4
ME 321	Dynamics I	4
ME 202	Engr. Mat. Sci. Structures	3
HY 102	World History	3
Basic ROTC or Elect.		1

Third Quarter

AE 300	Aerospace Anal. I	3
EE 262	Circuits	3
ME 301	Thermo. I	4
ME 207	Strength of Materials I	3
HY 103	World History	3
Basic ROTC or Elect.		1

EE 273	Elec. Devices	3
ME 340	Fluid Mechanics I	3
AE 307	Aero. Struct. I	5
AE 310	Aero. Anal. II	4
*Hum.-Soc. Elect.		3

EE 381	Electromag. Devices	4
AE 302	Airloads	4
AE 303	Theor. Aero. I	3
AE 311	Aero. Mat. & Meth. of Construction	2
PS 320	Modern Physics	3
*Hum.-Soc. Elect.		3

AE 409	Aero. Struct. II	5
AE 304	Theor. Aero. II	4
AE 415	Jet Propul.	5
AE 326	Fund. of Aerospace Dynamics	3

SENIOR YEAR

AE 305	Flight Perform.	2
AE 439	Static Stability & Cont.	3
AE 429	Aircraft Vibration and Flutter	3
AE 401	Aero. Prob. I	1
Tech. Elective		3
*Hum.-Soc. Elect.		6

AE 432	Astrodynamics I	3
AE 441	Dyn. Stab. & Cont.	3
AE 400	Viscous Aero.	4
AE 448	Aero. Design I	1
Tech. Elective		3
*Hum.-Soc. Elect.		3

AE 433	Astrodynam. II	3
AE 434	Aero. Syst. Anal.	3
AE 449	Aero. Design II	1
AE 402	Aero. Prob. II	1
Tech. Elect.		3
*Hum.-Soc. Elect.		5

Total — 208 quarter hours

*See page 168 for the selection of Humanistic-Social Electives. Six hours of Advanced ROTC may be substituted for six hours of Humanistic-Social Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

AE 414	Equilibrium Gas Dynamics	3
AE 416	Rocket Propulsion I	3
AE 417	Rocket Propulsion II	3
AE 420	Dynamic Simulation	3
AE 421	Flight Vehicle Stress Analysis II	3
AE 424	Nonequilibrium Gas Dynamics	3
AE 428	Space Propulsion Systems	5
AE 435	Elements of V/STOL Flight	3
AE 436	Rotary Wing Aerodynamics	5
AE 442	Automatic Stability and Control	3
AE 445	Missile Aerodynamics	3
AE 491	Special Problems	1-5
CE 409	Environmental Health Engineering	5
CE 423	Similitude in Engineering	3
CE 424	Air Pollution	3
CN 440	Nuclear Engineering	5

IE 410 Probability and Statistics	5	MH 403 Engineering Mathematics II	5
ME 303 Thermodynamics III	3	MH 406 Elementary Partial Differential Equations	5
ME 401 Statistical Thermodynamics	3	MH 460 Introduction to Numerical Analysis	5
ME 421 Heat Transfer	4	MH 461 Numerical Matrix Analysis	5
ME 422 Transport Phenomena	3	PS 405 Nuclear Physics	5
ME 443 Photoelastic Stress and Strain Analysis	3		

Aviation Management

The curriculum in Aviation Management provides education for men and women who plan management careers with the airlines, general aviation, manufacturing, governmental agencies or the military services. The study of fundamental aerospace courses is combined with specified subjects in industrial engineering, business management and selected electives to provide preparation for the various specific functions of the aerospace industries including general management, production, operations, flying, maintenance, and education and training. Laboratory experience in aviation management and flight is provided through the university owned and operated airport in which the students are given the opportunity to participate in administration, training and aircraft maintenance and servicing. The Aviation Management curriculum also provides a broad educational background of fundamental philosophies, theories, and concepts needed for research and study at the graduate levels.

Curriculum in Aviation Management (AM)

FRESHMAN YEAR			
First Quarter		Second Quarter	
EH 101 English Comp.	3	EH 102 English Comp.	3
HY 101 World History	3	HY 102 World History	3
MH 160 Pre-Cal. w. Trig.	5	MH 161 An. Geom. & Cal.	5
TS 112 Weld. Sci. & App.	1	TS 113 Machine Tool Lab.	1
TS 102 Engr. Drawing I	2	TS 104 Descrip. Geom.	2
Basic ROTC or Elect.	1	Basic ROTC or Elect.	1
PE Physical Education	1	PE Physical Education	1
Third Quarter			
EH 103 English Comp.	3	EH 103 English Comp.	3
HY 103 World History	3	HY 103 World History	3
MH 162 An. Geom. & Cal.	5	MH 162 An. Geom. & Cal.	5
TS 114 Sheet Metal	1	TS 114 Sheet Metal	1
TS 105 Engr. Drawing II	2	TS 105 Engr. Drawing II	2
Basic ROTC or Elect.	1	Basic ROTC or Elect.	1
PE Physical Education	1	PE Physical Education	1
SOPHOMORE YEAR			
AM 201 Elem. Aeronaut.	5	PG 211 Psychology I	5
IE 201 Indus. Admin.	3	EC 274 Bus. & Econ. Statistics I	5
EC 200 Economics I	5	PS 206 Intr. Physics	5
PS 205 Intr. Physics	5	Basic ROTC or Elect.	1
Basic ROTC or Elect.	1	Basic ROTC or Elect.	1
JUNIOR YEAR			
AM 311 Propul. Fund.	5	AM 312 Guidance & Control Fund.	5
MN 341 Business Law	5	EH 304 Technical Writing	3
SC 311 Public Speaking	5	IE 320 Engr. Economy	5
IE 316 Electronic Data Processing Sys.	4	IE 310 Motion & Time Study	5
SENIOR YEAR			
AM 407 Air Transport	5	AM 409 Aerospace Legislation	3
PG 461 Indus. Psychol.	5	AM 416 Airport Mgt.	5
Technical Elective	5	MN 442 Personnel Mgt.	5
Hum.-Soc. Elective	3	Technical Elective	5
AM 402 Aerospace Veh. Systems	5	AM 417 Airline Oper.	5
AM 401 Aeronautical Seminar	1	AM 401 Aeronautical Seminar	1
Technical Elective	5	Technical Elective	5

Total — 207 quarter hours

Six hours of Advanced ROTC may be substituted for SC 311 (5 Hrs.) and one additional hour of Humanistic-Social Electives, or 3 hours of Humanistic-Social Electives.

See page 168 for the selection of Humanistic-Social Electives. Technical Electives must be approved by the Department Head.

Department of Chemical Engineering

The chemical engineer is concerned with the production and processing of a vast array of products. These processes invariably involve chemical reactions and physical separations. The chemical engineer's work can vary from small bench scale experiments to the design and operation of huge chemical plants. Typical industries that employ chemical engineers include the petroleum, chemical, iron and steel, pulp and paper, fertilizer, and fiber industries among others. The broad background of chemical engineering is especially useful for those individuals who desire to specialize in environmental engineering.

An extensive knowledge of chemistry and, in particular, chemical thermodynamics and chemical kinetics is required for chemical engineering. Quantitative aspects are very important so that an aptitude for mathematics is essential for the successful chemical engineer. The principles of physics are hardly less important than those of chemistry.

The program leading to the bachelor's degree in chemical engineering consists almost entirely of broad scientific and engineering principles, which have numerous applications in the chemical and related industries. The student may select a major interest area during his junior year. These include process engineering, nuclear engineering, biochemical engineering, environmental engineering, engineering science, and production management. Technical electives may be selected in all of these and other areas on an individual basis. Those students who elect to continue their education through one or more advanced degrees are qualified for better positions and often make more rapid progress than those with only the bachelor's degree.

The broad university training provided, when supplemented by professional experience, enables graduates to qualify for positions as engineers in production, research and development, sales engineering, plant design and management.

The curriculum in chemical engineering is offered under both the regular and the co-operative plan. See the Co-operative Education program.

Curriculum in Chemical Engineering (CHE)

FRESHMAN YEAR

First Quarter

CH 111 Gen. Chemistry	5
MH 161 An. Geom. & Cal.	5
EH 101 English Comp.	3
TS 106 Graphic Methods	2
CHE 101 Chem. Engr. Fund.	4
PE Physical Education	1

Second Quarter

CH 112 Gen. Chemistry	5
MH 162 An. Geom. & Cal.	5
EH 102 English Comp.	3
*HY 101 World History	3
PE Physical Education	1

Third Quarter

CH 113 Gen. Chemistry	5
MH 163 An. Geom. & Cal.	5
EH 103 English Comp.	3
*HY 102 World History	3
PE Physical Education	1

SOPHOMORE YEAR

*HY 103 World History	3
MH 264 An. Geom. & Cal.	5
PS 220 Gen. Physics	4
**Hum.-Soc. Elect.	5

CH 303 Organic Chemistry	5
MH 265 Diff. Equations	3
PS 221 Gen. Physics II	4
CE 205 Eng. Mech. Statics	4

CH 304 Organic Chemistry	5
CHE 213 Comp. in ChE	2
PS 222 Gen. Physics	4
CE 207 Mech. of Solids	3
EE 262 Circuits	3

JUNIOR YEAR

CHE 321 Proc. Prin. I	4
CHE 331 Engr. Thermo.	3
CH 407 Phys. Chem.	5
**Hum.-Soc. Elect.	5

CHE 322 Proc. Prin. II	4
CHE 352 Fluid Mechanics	4
CH 408 Phys. Chem.	5
***Tech. Elective	3
**Hum.-Soc. Elect.	3

CHE 313 ChE Analysis	4
CHE 353 Heat Transfer	4
CHE 343 Stagewise Proc.	4
**Hum.-Soc. Elect.	5

SENIOR YEAR

First Quarter		Second Quarter		Third Quarter	
CHE 421 ChE Thermo.	4	CHE 442 ChE Design I	4	CHE 443 ChE Design II	6
CHE 451 Mass Transfer	4	CHE 422 Kinetics	4	***Tech. Elective	10
CHE 411 Proc. Cont.	5	CHE 482 ChE Lab.	6	**Hum.-Soc. Elect.	2
***Tech. Elective	5	***Tech. Elective	4	CHE 470 Seminar	1

Total — 209 quarter hours

*May be taken in any sequence.

**See page 168 for the selection of Humanistic-Social Elective. Six hours of Basic ROTC may be substituted for six hours of Humanistic-Social Electives. Three hours of Advanced ROTC may be substituted for three hours of Technical Electives.

***Technical electives shown above total 22 hours. They may be taken in one of the following 6 areas. Typical courses in each area from which the 22 hours may be selected with the consent of faculty advisor are listed below.

TECHNICAL ELECTIVES

Process Engineering

CH 413 Anal. Chem.	5
CH 415 Polymer Tech.	5
CHE 440 Nuclear Eng.	5
CHE 450 Spec. Topics in ChE	TBA
CHE 460 Intr. to Plast.	3
CHE 465 Ind. Waste Water Treatment	4
CHE 485 Air Qual. Eng.	5
EE 273 Electronics Dev.	3
IE 410 Eng. Statistics	5
ME 436 Ferrous Metal.	3

Environmental Engineering

BI 101 Prin. of Biology	5
BY 300 Gen. Microb. I	5
BY 441 Sanitary Microb.	5
CE 305 Water Supply & Disposal Systems	4
CE 409 Envir. Hlth. Eng.	5
CE 424 Air Pollution	3
CH 305 Organic Chemistry	5
CH 413 Anal. Chemistry	5
CHE 450 Spec. Topics in ChE	TBA
CHE 465 Ind. Waste Water Treatment	4
CHE 485 Air Qual. Eng.	4

Biochemical Engineering

BI 101 Prin. of Biology	5
BY 300 Gen. Microb. I	5
BY 301 Gen. Microb. II	5
BY 401 Bio. Statistics	5
BY 442 Gen. Virology	5
CH 418 Biochemistry	5
CH 419 Biochemistry	5
CH 420 Biochemistry	5
CHE 450 Spec. Topics in ChE	TBA
CHE 495 Biochemical Eng.	3
VM 210 Human Physiology	5

Engineering Science

CH 409 Phys. Chemistry	5
CH 413 Anal. Chemistry	5
CHE 450 Spec. Topics in ChE	TBA
IE 410 Eng. Statistics	5
ME 341 Fluid Mech. II	3
MH 266 Topics in Linear Algebra	3
MH 362 Eng. Math I	3
MH 401 Cal. of Vector Functions	3
MH 403 Eng. Math II	5
MH 405 Matrix Th. & Appl.	5
PS 320 Modern Physics	3

Nuclear Engineering

CHE 440 Nuclear Eng.	5
CHE Spec. Topics in ChE	TBA
EE 273 Electronic Dev.	3
ME 335 Phys. Metallurgy	4
ME 425 Gas & Steam Turb.	4
PS 305 Intr. to Mod. Phys.	5
PS 320 Mod. Phys. for Eng.	3
PS 405 Nuclear Physics	5
PS 417 Intr. to Biophysics	5
PS 470 Health Physics	5

Production Management

AFC 215 Fund. of Gen. & Cost Accounting	5
AFC 361 Prin. of Bus. Fin.	5
CHE 450 Spec. Topics in ChE	TBA
IE 201 Ind. Admin.	3
IE 302 Prod. Cont. Tech.	3
IE 410 Eng. Statistics	5
MN 310 Prin. of Mgt.	5
MN 341 Business Law	5
MN 342 Business Law	5
MN 346 Hum. Rel. in Mgt.	5
MN 455 Legal Envir. of Bus.	5
MT 331 Prin. of Marketing	5
MT 472 Econ. of Transp.	5

Department of Civil Engineering

Civil Engineering is an extremely broad professional field. The areas of interest may range from the behavior of thin shell structures to traffic flow theory, from hydraulics to the utilization of computers, from earth physics to microbiology, from the psychology of automobile driver behavior to water resources. Civil engineering problems involve the physical, mathematical, life, earth, social, political, communications, and engineering sciences. Civil engineering projects involve many other professional areas, including architecture, law, public health, economics, management, sociology, finance, and other branches of engineering. The scope and complexity of the field, and its degree of involvement with other fields, has increased rapidly with the development of modern science and technology and with the growth of population and national economies.

The Civil Engineering curriculum provides a background in mathematics and the physical sciences, in humanistic-social studies, and in the engineering sciences and the interrelated subdisciplines of civil engineering. Technical electives permit the undergraduate limited specialization in an area of civil engi-

neering such as construction, environmental engineering, soils, structures, transportation, or water resources.

The civil engineer plays an essential role in the realization of some of the most basic goals, objectives, and needs of society. These relate to man's need for shelter, mobility, water, air, and productive land — the environment in which he lives and works.

Curriculum in Civil Engineering (CE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, Page 167)

First Quarter

MH 264 An. Geom. & Cal.	5
CE 205 Engineering Mech.-Statics	4
*HY 102 World History	3
PS 221 General Physics II	4
CE 200 Intr. to Civil Engr.	1
Basic ROTC or Elect.	1

SOPHOMORE YEAR

Second Quarter

EC 200 Economics	5
MH 265 Diff. Equations	3
*HY 103 World History	3
CE 202 Intr. to Computer Methods in Civil Engineering	3
PS 222 General Physics III	4
Basic ROTC or Elect.	1

Third Quarter

CE 207 Mechanics of Solids	3
CE 201 Surveying	5
CE 301 Transform Methods in Engineering Analysis	5
**Hum.-Soc. Elect.	3
Basic ROTC or Elect.	1

JUNIOR YEAR

EE 262 Circuits	3
CE 302 Civil Engr. Econ.	3
CE 320 Fund's of Transp. Engr.	5
CHE 331 Engineering Thermodynamics	3
ME 321 Dynamics I	4

CE 304 Theo. of Struc. I	5
IE 410 Engr. Statistics	5
CE 315 Engineering Geology	4
CHE 352 Fluid Mechanics	4

CE 380 Theo. of Struc. II	5
CE 308 Hydraulics	5
CE 406 Soil Mechanics I	5
PS 320 Modern Physics for Engineers	3

SENIOR YEAR

Second Quarter

CE 405 Water and Waste Water Treatment	5
CE 417 Soil Mechanics II	3
Tech. Elective	3
**Hum.-Soc. Elec.	6

Third Quarter

CE 489 Civil Engr. Design	5
Tech. Elective	8
**Hum.-Soc. Elec.	3

CE 404 Structural Analysis	4
CE 305 Water Supply and Disposal	4
EE 273 Electronic Devices	3
Tech. Elective	3
**Hum.-Soc. Elec.	3

Total — 209 quarter hours

*Recommended approved alternate sequence: HY 205-6.

**See page 168 for the selection of Humanistic-Social Electives.

Six hours of Advanced ROTC may be substituted for six hours of Humanistic-Social Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CE 400 Advanced Surveying and Mapping	5	CE 492 Linear Optimization Methods	5
CE 407 Urban Engineering I	3	CE 493 Discrete Optimization Methods	5
CE 409 Environmental Health Engineering	5	BI 101 Principles of Biology	5
CE 410 Transportation Engineering	5	BI 104 Biology in Human Affairs	5
CE 411 Flow in Open Channels	5	CH 105 Fundamentals of Chemistry III	3
CE 412 Hydrology	5	CH 105L General Chemistry Laboratory	2
CE 414 Structural Steel	4	CHE 430 Analog Computation	2
CE 415 Construction Planning	5	CHE 440 Nuclear Engineering	5
CE 416 Reinforced Concrete and Prestressed Concrete	5	EE 381 Electromagnetic Devices	4
CE 419 Urban Engineering II	3	EE 446 Analog Computers	3
CE 420 Sanitary Engineering Laboratory	5	ME 322 Dynamics II	4
CE 421 Water Resources Engineering	5	MH 403 Engineering Mathematics II	5
CE 423 Similitude in Engineering	3	MH 405 Matrix Theory and Applications	5
CE 424 Air Pollution	3	MH 406 Elementary Partial Differential Equations	5
CE 425 Soil Stabilization	3	MH 460 Intr. to Numerical Analysis	5
CE 426 Air Pollution Control	3	MH 461 Numerical Matrix Analysis	5
CE 428 Radiological Health Engineering	3	PS 401 Theoretical Physics I — Mechanics	5
CE 430 Foundation Design and Construction	3	PS 402 Theoretical Physics II — Mechanics	5
CE 490 Special Problems	1-5	PS 405 Nuclear Physics	5

Department of Electrical Engineering

The curriculum in Electrical Engineering keeps pace with significant developments in science and technology; provides an educational preparation that assures maximum rate of progress in the engineering profession; and does this within the framework of a sound and extensive humanistic social program.

The Electrical Engineering curriculum is organized around six basic areas of study. These areas provide a firm background in the basic concepts required for all Electrical Engineering students. They are (1) Circuit Analysis, (2) Electronics and Communication, (3) Energy Conversion and Transmission, (4) Electromagnetic Fields, (5) Automatic Control, and (6) Computer Engineering. In addition, technical electives in the senior year provide flexibility in the curriculum to accommodate the diversity of interests and talents among the students. A student, through his choice of technical electives, can concentrate on a topic of individual interest or choose a combination of electives from different areas to maintain a broad program. Electives relevant to each of the specialized topics in Electrical Engineering, along with additional courses which are related to these topics, are listed under the section on technical electives.

Many required courses have associated laboratories, in order to keep the student in maximum contact with the realities of the practice of engineering.

Curriculum in Electrical Engineering

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 167)

SOPHOMORE YEAR

First Quarter	Second Quarter	Third Quarter
MH 264 An. Geom. & Cal. — 5	MH 265 Linear Diff. Equat. — 3	MH 266 Linear Algebra — 3
PS 221 General Physics II — 4	PS 222 General Physics III — 4	IE 311 Statistics I — 3
HY 102 World History — 3	HY 103 World History — 3	EE 322 Combinational Logic
EE 201 Intr. to EE — 3	ME 205 Appl. Mech.-Statics — 4	Systems — 3
ME 202 Eng. Matls. Sc. — 3	EE 262 Circuits — 3	EE 361 Network Analysis — 5
Structures — 3	Basic ROTC or Elective — 1	EE 273 Electronic Devices — 3
Basic ROTC or Elective — 1		Basic ROTC or Elective — 1

JUNIOR YEAR

EE 381 Electro. Devices — 4	EE 383 Electromech. Energy	EE 483 Energy Conversion
EE 372 Electronics I — 4	Conversion — 4	and Distribution — 3
EE 362 Linear Systems — 5	EE 373 Electronics II — 5	EE 471 Comm. Theory — 5
EE 324 Sequential	EE 452 Auto. Feedback	PS 320 Mod. Phy. for Eng. — 3
Machines — 3	Control Systems — 5	EE 392 Electromag. II — 4
EE 325 Logic and Comp.	EE 391 Electromag. I — 3	EE 425 Computer Organ. — 3
Systems Lab. — 1		

SENIOR YEAR

EE 393 Electromag. III — 4	ME 301 Thermodynamics I — 4	ME 321 Dynamics I — 4
*Hum.-Soc. Elect. — 9	*Hum.-Soc. Elect. — 6	*Hum.-Soc. Elect. — 6
**Tech. Elective — 4	**Tech. Elective — 6	Free Elective — 6
		**Tech. Elective — 3

Total — 210 quarter hours

*Hum.-Soc. Studies selected from approved list.

**Selected from approved list. Six hours advanced ROTC may be substituted.

SUGGESTED TECHNICAL ELECTIVES

Circuit Analysis

EE 464 Intr. Network Synthesis	3
EE 465 Advanced Circuit Analysis	3

Electronics and Communications

EE 412 Elect. Prop. of Materials	3
EE 413 Physical Electronics	3
EE 473 Communication Systems	3
EE 474 Solid State Electronics	3

Energy Conversion and Transmission

EE 446 Analog Computers	3
EE 485 Power Systems Engineering	4
EE 486 Direct Energy Conversion	3

Electromagnetic Fields

EE 397 Intr. to Acoustics and Noise Control	3
EE 494 Electromagnetic Propagation	3
EE 495 Microwaves	3
EE 496 Antennas	3

Automatic Control

EE 354 State Space System Analysis	3
EE 454 Intr. to Modern Control Theory	3
EE 455 Automatic Control Instrumentation	3

Computer Engineering

EE 326 Fault Detection in Logic Circuits	3
EE 327 Error Detecting and Correcting Codes	3
EE 422 Digital Computer Architecture	3
EE 424 Digital Computing Systems	3
EE 446 Analog Computers	3
EE 426 Computer Applications in EE I	3
EE 427 Computer Applications in EE II	3
IE 300 Computer Programming	3
IE 455 Advanced Computer Programming	3
MH 460 Intr. to Numerical Analysis	5
MH 461 Numerical Matrix	5

OTHER TECHNICAL ELECTIVES

IE 312-3 Engineering Statistics II-III	3-3	MH 401 The Calculus of Vector Functions	3
IE 314 Operations Analysis I	3	MH 403 Engineering Mathematics II	5
IE 315 Linear Programming	3	MH 405 Matrix Theory and Applications	5
IE 325-6 Engineering Economics Analysis I-II	3-3	MH 411-412 Intr. to Calculus of Variations	3-3
IE 416-7 Operations Analysis III-IV	3-3	MH 414 Applied Algebra	5
IE 442 Advanced Linear Programming	3	MH 460 Intr. to Numerical Analysis	5
IE 453 Dynamic Programming	3	MH 461 Numerical Matrix Analysis	5
ME 207 Strength of Materials I	3	PS 401-2-3 Theoretical Physics I, II, III	5-5-5
ME 340 Fluid Mechanics I	3	PS 404 Thermodynamics	5
ME 401 Statistical Thermodynamics	5	PS 415-16 Intermediate Modern Physics, I, II	5-5
ME 402 Intr. to Optimal Systems	5	PS 425 Principles of Nuclear Energy Systems	5
ME 421 Heat Transfer	4	PS 435 Intr. to Solid State Physics	5
ME 422 Transport Processes	3	CHE 440 Nuclear Engineering	5
MH 310 Intr. to Calculus of Variations	3		

Department of Industrial Engineering

Industrial Engineering differs from other branches of the engineering profession in three basic ways. First, it covers all types of industrial, commercial, and service activity. Second, it is the only branch of engineering which gives substantial emphasis to the role of people as well as machines and materials in systems design. Third, it becomes heavily involved in the economic and financial aspects of the problems it considers. While the Industrial Engineer is still concerned with production systems, many non-industrial organizations have recognized the value of Industrial Engineering techniques, and Industrial Engineers are practicing in health, marketing, financial, governmental, military, transportation, educational, agricultural, and consulting organizations. Furthermore, they have increasingly become involved in interdisciplinary activities.

The Industrial Engineering curriculum emphasizes the systems approach to design, operation, and control and provides the student with competencies in quantitative and qualitative analysis and solution procedures to the resource utilization data processing, information flow, management, economic, human factors, and human ecology problems associated with almost any system. The curriculum includes departmental courses in the areas of: *computer systems and programming, simulation, mathematical optimization methods, probability and statistics, operations research, production processes, facilities design, human performance, and the design of man's work environment and work methods.* Additionally, an option in occupational safety and health is available to the student wishing to specialize in this important area of Industrial Engineering practice. Supporting courses taken in other departments include mathematics,

physical science, engineering science, economics, psychology and social science. An elective program equivalent to approximately two quarter's course work permits the student to pursue further topics of personal and professional interest.

A wide variety of employment opportunities is available to the Industrial Engineer since his competencies are required by almost all manufacturing and service organizations. Additionally, Industrial Engineering practice is considered excellent training for top management positions.

Option in Occupational Safety and Health. — This option utilizes most of the student's elective course work hours to develop specific competencies in the rapidly expanding field of occupational safety and health. The option builds on the student's basic Industrial Engineering background to prepare him to function in the following topic areas:

1. Identification and evaluation of OSH conditions, practices, and loss potential factors.
2. Analysis, design, and implementation of OSH control methods, procedures and programs.

Curriculum in Industrial Engineering (IE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 167)

SOPHOMORE YEAR

First Quarter	Second Quarter	Third Quarter
IE 202 Ind. Engr. Fund. — 3	IE 317 Ergonomics I — 3	IE 311 Statistics I — 3
MH 264 An. Geom. & Cal. — 5	MH 265 Diff. Equations — 3	IE 325 Engr. Econ. I — 3
PS 221 Gen. Physics II — 4	PS 222 Gen. Physics III — 4	EC 200 Economics I — 5
PG 211 Gen. Psychology — 5	HY 102 World History — 3	HY 103 World History — 3
Basic ROTC or Elective — 1	EE 262 Circuits — 3	EE 273 Elec. Devices — 3
	Basic ROTC or Elective — 1	Basic ROTC or Elective — 1

JUNIOR YEAR

IE 312 Engr. Stat. II — 3	IE 313 Engr. Stat. III — 3	IE 315 Linear Prog. — 3
IE 326 Engr. Econ. II — 3	PG 321 Exp. Psych. II: Perception — 4	IE 305 Info-Decis. Sys. — 3
IE 314 Oper. Anal. I — 3	IE 300 Computer Prog. — 3	IE 318 Ergonomics II — 3
EE 381 Electromag. Dev. or ME 301 Thermodynamics — 4	ME 205 App. Mech.-Statics — 4	ME 321 App. Mch. Dynam. — 4
PS 320 Modern Physics — 3	MH 266 Linear Algebra — 3	*Tech. Elective — 6

SENIOR YEAR

IE 416 Oper. Anal. II — 3	**IE 417 Oper. Anal. III — 3	***IE 428 Oper. & Fac. Des. II — 3
IE 424 Prod. Cont. Func. I, II	IE 425 Prod. Cont. Func. II — 3	Hum. Elective — 5
IE 414 Engr. Stat. IV — 3	*IE 427 Oper. & Fac. Des. I — 3	*Free Elective — 5
IE 419 Ergonomics III — 3	IE 400 Seminar — 1	*Tech. Elective — 5
ME 207 Stren. of Mat. I — 3	*Tech. Elective — 6	

Total — 208 quarter hours

*For students electing the Occupational Safety and Health option the following are required in place of these electives: IE 401, IE 402, IE 403, IE 404, IE 405, IE 406, EE 397, and ME 444.

**Students in the OSH option may elect alternative courses with the department head's approval.

***Students in the OSH option will be assigned to special sections of these courses.

SUGGESTED ELECTIVES

A pamphlet describing the student's elective options and suggested courses is available in the IE departmental offices. Elective courses are available in all fields of engineering represented on campus, computer science, operations research, statistics, production analysis, management, economics, psychology and human performance, mathematics, environmental quality, and ecology. Six hours of advanced ROTC may be substituted for six hours of humanistic or free electives.

Department of Mechanical Engineering

Students who complete the curriculum in Mechanical Engineering have a broad field from which to select their life's work. Industrial positions in manufacturing, marketing, maintenance, and design are available to graduate mechanical engineers in a large variety of companies which produce mechanical, chemical, electrical, aerospace, nautical, and petroleum products. In addition, the graduate is prepared by his college training, when supplemented by experience and practical training, to specialize in management or in engineering services, such as consulting and sales. The curriculum also is suitable for students intending to enter the fields of engineering education and research. It is an excellent base for further study at the graduate level in this and allied fields.

The curriculum provides the student with a strong background in mathematics and the physical sciences. The basic engineering science fields of engineering mechanics, materials science, thermodynamics, fluid mechanics, and heat and mass transfer are covered in depth to provide the student with understanding and with the ability to solve problems in these areas. In addition, professional training is given in combustion engines, including gas turbines and rockets, power plants, air conditioning, refrigeration, automatic controls, turbomachinery and machine design. A series of courses in electrical theory and electronics is also included to equip the graduate with needed fundamental knowledge in this rapidly expanding field.

Modern design courses at senior level, employing both the case study and the individual project techniques, provide an opportunity for the student to solve typical engineering problems, requiring the development of skill and co-operation in creative design and optimization and in the use of analysis and synthesis.

Humanistic-social subjects are required to give the student breadth and to add to his general education.

Technical electives are provided in the senior year of the curriculum to enable students to specialize to a limited extent. Recently added is a sequence in optimization theory. Students intending to undertake graduate studies may take additional mathematics in lieu of certain professional technical electives.

Curriculum in Mechanical Engineering (ME)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 167)

SOPHOMORE YEAR

First Quarter	Second Quarter	Third Quarter
PS 221 General Physics II —4	ME 202 Engr. Materials Science—Structure —3	EE 262 Circuits —3
MH 264 An. Geom. & Cal. —5	ME 207 Strength of Materials I —3	ME 316 Strength of Materials II —4
ME 205 Applied Mechanics—Statics —4	PS 222 General Physics III —4	ME 321 Dynamics I —4
HY 102 World History —3	HY 103 World History —3	ME 308 Computation Lab. —2
Basic ROTC or Elect. —1	MH 265 Linear Differential Equations —3	MH 266 Topics in Linear Algebra —3
	ME 210 Engineering Method.1	ME 309 Materials Testing Laboratory —1
	Basic ROTC or Elect. —1	Basic ROTC or Elect. —1

JUNIOR YEAR

ME 322 Dynamics II —4	ME 304 Engr. Materials Science—Properties —3	ME 335 Engr. Materials Science—Metallurgy —4
ME 301 Thermodynamics I —4	ME 302 Thermodynamics II —3	ME 303 Thermodynamics III.3
MH 362 Engr. Math I —3	EE 381 Electromag. Dev. —4	PS 320 Modern Physics for Engineers —3
EE 275 Electronic Devices —3	ME 340 Fluid Mechanics I —3	ME 341 Fluid Mechanics II.4
†SC 202 App. Sp. Comm. —3	ME 323 Dynamics of Machines —4	ME 312 Measurements Lab. —3

SENIOR YEAR

First Quarter	Second Quarter	Third Quarter
ME 421 Heat Transfer — 4	ME 415 Thermodynamics of Power Systems — 4	ME 451 Advanced Projects — 3
ME 439 Mech. Engr. Design I — 4	ME 440 Mech. Engr. Design II — 3	ME 420 Thermal Systems Laboratory — 2
ME 427 Dynamics of Physical Sys. — 4	ME 422 Transport Processes — 3	*Hum.-Soc. Elective — 9
*Hum.-Soc. Elective — 3	*Hum.-Soc. Elective — 6	Technical Elective — 4
Technical Elective — 3	Technical Elective — 3	

Total — 210 quarter hours

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and three additional hours approved by the Department Head.

*See page 168 for the selection of Humanistic-Social Electives.

NOTE: The recommended technical elective sequence in optimization theory is MH 310 and ME 402. Additional courses following this sequence are available.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department and the Dean of Engineering.

CE 305 Water Supply and Disposal Systems — 4	ME 437 Engineering Materials Science— Non-Ferrous Metallurgy — 3
CE 380 Theory of Structures II — 5	ME 438 Residual Stresses in Metals — 3
CE 404 Structural Analysis — 4	ME 441 Engineering Systems — 1-5
CHE 440 Nuclear Engineering — 5	ME 442 Computer Aided Design — 3
EE 322 Combinational Logic Circuits — 3	ME 443 Photoelastic Stress and Strain Analysis — 3
EE 391 Electromagnetics I — 4	ME 450 Special Problems — 1-5
IE 315 Linear Programming — 3	MH 310 Introduction to Calculus of Variations — 3
IE 326 Engineering Economic Analysis II — 3	MH 401 The Calculus of Vector Functions — 3
IE 453 Dynamic Programming — 3	MH 403 Engineering Mathematics II — 5
TS 450 Engineering Metrology — 1-5	PS 413 Introduction to X-Ray Crystallography — 5
ME 401 Statistical Thermodynamics — 3	PS 425 Principles of Nuclear Energy Systems — 5
ME 402 Introduction to Optimal Systems — 4	
ME 414 Turbomachines — 4	
ME 425 Gas and Steam Turbines — 4	
ME 428 Air Conditioning and Refrigeration — 4	
ME 432 Automatic Controls — 3	
ME 436 Engineering Materials Science— Ferrous Metallurgy — 3	

Materials Engineering

The curriculum in Materials Engineering is administered by the Department of Mechanical Engineering of the School of Engineering. It is an interdisciplinary curriculum conducted co-operatively by academic departments of the School of Engineering and the School of Arts and Sciences through a faculty Materials Engineering Curriculum Committee.

Materials Engineering includes both the design of materials and materials processes to meet specific needs. Materials Engineers are employed in the basic metallurgical, ceramics, plastics, electronics, aerospace, mechanical, process, chemical, and nuclear power industries. The profession of Materials Engineering is a modern out-growth of the older professions of metallurgical, ceramic, and plastics engineering. It represents a unification of basic principles and experience in materials design to meet the expanding current needs for industrial materials. Every aspect of industrial and technological progress depends upon proper materials design and application.

The curriculum in Materials Engineering is planned to provide the necessary foundation in the humanities, basic sciences, engineering sciences, and particularly in the science of the relationship of structure to properties. The curriculum will prepare the engineer for professional practice or graduate study. Today, many materials engineers occupy key positions in industry, government, research, and education.

The courses in Materials Engineering include the subjects of ceramic, metallic, and plastic materials design with the emphasis placed upon the structure of each type and its influence on the properties and performance in service. Fundamental relationships are emphasized to prepare the engineer to effectively meet modern design challenges that will be encountered. The equipment available is comprehensive and modern and includes metallurgical microscopes, X-ray diffraction and radiographic facilities, an electron microscope, and a variety of types of chemical and mechanical processing and testing machines.

Curriculum in Materials Engineering (MTL)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 167)

SOPHOMORE YEAR

First Quarter

MH 264	An. Geom. & Cal.	5
PS 221	Gen. Physics II	4
ME 205	Applied Mechanics— Statics	4
HY 102	World History	3
Basic ROTC or Elect.		1

Second Quarter

MH 265	Linear Differential Equations	3
PS 222	Gen. Physics III	4
ME 202	Engr. Materials Science—Structure	3
ME 207	Strength of Materials I	3
HY 103	World History	3
Basic ROTC or Elect.		1

Third Quarter

MH 266	Topics in Linear Algebra	3
CH 407	Physical Chem.	5
ME 304	Engr. Materials Science—Properties	3
ME 321	Dynamics I	3
ME 309	Materials Testing Laboratory	1
Basic ROTC or Elect.		1

JUNIOR YEAR

CH 408	Physical Chem.	5
ME 335	Engr. Materials Science—Physical Metallurgy	4
CHE 460	Intr. to Plastics	3
ME 308	Computation Lab.	2
*Hum.-Soc. Elective		3

ME 301	Thermodynamics I	4
ME 336	Physical Analysis of Materials I	4
ME 436	Engr. Materials Science—Ferrous Metallurgy	3
ME 312	Measurements Lab.	3
*Hum.-Soc. Elective		3

ME 421	Heat Transfer	4
ME 338	Phase Diagrams	4
ME 437	Engr. Materials Science—Non-ferrous Metallurgy	3
EE 262	Circuits	3
Technical Elective		3

SENIOR YEAR

PS 320	Modern Physics for Engineers	3
CH 415	Polymer Tech.	4
ME 448	Intr. to Ceramics	3
EE 273	Electronic Devices	3
*Hum.-Soc. Elective		5

PS 413	Intr. to X-Ray Crystallography	5
CHE 475	Rate Processes in Materials	3
EE 381	Electromagnetic Devices	4
†SC 202	App. Sp. Comm.	3
Technical Elective		3

ME 446	Advanced Physical Metallurgy— Theoretical	3
	Metallurgy	3
ME 451	Advanced Proj.	3
Technical Elective		5
*Hum.-Soc. Elective		6

Total — 206 quarter hours

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and three additional hours approved by the Department Head.

*See page 168 for the selection of Humanistic-Social Electives.

NOTE: The sequence CH 111 and CH 112 may be substituted for the sequence CH 103/CH 103L and CH 104/CH 104L.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CH 207	Organic Chemistry	5	PS 300	Intermediate Electricity and Magnetism I	5
CH 410	Intermediate Inorganic Chemistry	5	PS 303	Optics	5
EE 412	Electrical Properties of Materials	3	PS 304	Applied Spectroscopy	5
EE 413	Physical Electronics	3	PS 414	Electron Optics and Microscopy	5
GL 301	Mineralogy I	5	PS 415	Intermediate Modern Physics I	5
ME 337	Physical Analysis of Materials II	4	PS 435	Intr. to Solid State Physics	5
ME 438	Residual Stresses in Metals	3	TE 305	Fiber Technology	3
ME 443	Photoelastic Stress & Strain Analysis	3	TE 424	Man-Made Fibers I	5
ME 447	Advanced Physical Metallurgy— Plasticity	4			

Department of Textile Engineering

The Department of Textile Engineering is equipped with the full-size machinery of a complete textile mill for the manufacture of a wide variety of

fabrics from the processing of the raw material to the weaving of the finished product. Included are laboratories for bleaching, dyeing, finishing, and the physical and chemical testing of fibers and fabrics.

The textile industry is the largest industry in Alabama, comprising more than 25 per cent of the total industrial working force in the state. The greater portion of the textile industry, making yarn on the cotton system, is located in the South and Southeast. In the Southern Region alone, there are some 1500 plants which process cotton, rayon, nylon, wool, and paper and an almost unlimited number of finished products. The industry is growing rapidly in all branches.

The size and diversity of the textile and allied industries, including manufacturers of textile machinery and equipment, chemicals and dyestuffs, research laboratories, textile supply, and sales houses, afford unusual opportunities for college-trained men and women. New fields of employment are opening in research and development and in the process of new fibers. The need for college graduates in textile engineering has never been greater than at the present time, nor is the demand likely to be met within the next several years.

The Department of Textile Engineering offers three curricula to prepare students for all areas of the industry. The Textile courses in these curricula are combined with courses offered by other departments of the University to provide basic instruction in the fundamental sciences, engineering, technology and humanistic-social studies. The three curricula are:

Textile Engineering. — The curriculum in Textile Engineering trains men and women in the basic engineering sciences. It includes basic engineering sciences, humanistic-social studies, and textile subjects needed for a basic understanding of the textile industry. It prepares students for graduate study and careers in textile research, engineering, production and management in the textile industry as well as in other allied industries, such as the manufacture of textile machinery and man-made fibers.

Textile Chemistry. — The curriculum in Textile Chemistry trains students in the chemistry of natural and man-made fibers and in the theory and practice of textile dyeing and finishing. It prepares students for graduate work and careers as chemists and dyers in the textile, man-made fibers, dyestuff and other allied industries.

Textile Management. — The curriculum in Textile Management prepares the student for production, administrative and managerial positions in the textile and allied industries. Emphasis is placed on production and operational functions and the humanistic-social studies with the inclusion of textile subjects. Students are permitted in their junior and senior years to major in production, sales, or design according to their interests and professional needs.

The Alabama textile industry cooperates with the Department of Textile Engineering by assisting worthy young men and women to obtain a college education through the Co-operative Education Program, which is described on page 47 of this catalog.

The Department of Textile Engineering is organized and equipped to conduct applied and fundamental research. In cooperation with the Engineering Experiment Station, and other departments of the University, the department serves the textile industry of the region through the full utilization of its facilities.

Curriculum in Textile Engineering (TE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 167)

SOPHOMORE YEAR

First Quarter

TE 210 Fiber Process	5
MH 264 An. Geom. & Cal.	5
HY 102 World History	3
PS 221 Gen. Physics II	4
Basic ROTC or Elect.	1

Second Quarter

TE 101 Intr. Textiles	1
MH 265 Linear Dif. Eq.	3
HY 103 World History	3
PS 222 Gen. Phys. III	4
TE 211 Yarn Mfg. I	5
Basic ROTC or Elect.	1

Third Quarter

TE 220 Weav. & Des. I	5
ME 205 App. Mech. Statics	4
ME 202 EMS-Structures	3
+SC 202 App. Sp. Comm.	3
Basic ROTC or Elect.	1

JUNIOR YEAR

ME 207 Stren. Mtrls. I	3
EE 262 Circuits	3
TE 307 Bleach. & Dyeing	5
TE 325 Text. Qual. Cont.	2
ME 301 Thermodynamics I	4

ME 321 Dynamics I	4
EE 273 Elec. Devices	3
TE 320 Weav. & Des. II	5
PS 320 Mod. Phys./Engrs.	3
IE 201 Ind. Admin.	3

ME 340 Fluid Mech. I	3
EE 381 Elec. Mag. D.	4
TE 324 Phys. Testing	3
TE 319 Chem. Testing	2
IE 205 Com. & Info. Sys.	3

SENIOR YEAR

TE 405 Warp Prepara.	5
+EH 304 Tech. Writing	3
EC 200 Gen. Economics	5
*Hum.-Soc. Elective	3

TE 406 Text. Costing	5
TF 305 Fiber Technology	3
PG 211 Gen. Psychology	5
Technical Elective	5

TE 431 Fabric Analysis	3
TE 412 Text. Mgt.	3
TE 424 Man-Made Fibers	5
*Hum.-Soc. Elective	3
Technical Elective	5

Total — 205 quarter hours

*Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and EH 304 (3 hrs.).

*See page 168 for the selection of Humanistic-Social Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

MC 341 Business Law	5
EC 402 American Industries	5
IE 301 Electronic Data Proc.	5
IE 310 Motion & Time Study	5
IE 320 Engineering Economy	5

TS 308 Gages & Measurements	5
TE 321 Weaving & Design III	5
TE 322 Yarn Manufacturing II	5
TE 425 Man-Made Fibers II	5

Curriculum in Textile Chemistry (TC)

FRESHMAN YEAR

First Quarter

CH 111 Gen. Chem.	5
EH 101 English Comp.	3
MH 160 Pre-Cal. w. Trig.	5
LY 101 Use of Library	1
TE 101 Intr. Textiles	1
Basic ROTC or Elect.	1
PE Physical Education	1

Second Quarter

CH 112 Gen. Chem.	5
EH 102 English Comp.	3
MH 161 An. Geom. & Cal.	5
HY 101 World History	3
Basic ROTC or Elect.	1
PE Physical Education	1

Third Quarter

CH 113 Gen. Chem.	5
EH 103 English Comp.	3
MH 162 An. Geom. & Cal.	5
HY 102 World History	3
Basic ROTC or Elect.	1
PE Physical Education	1

SOPHOMORE YEAR

CH 204 An. Chem.	3
CH 204L An. Chem. Lab.	2
MH 163 An. Geom. & Cal.	5
HY 103 World History	3
+SC 202 App. Sp. Comm.	3
Basic ROTC or Elect.	1

CH 205 An. Chem.	5
MH 264 An. Geom. & Cal.	5
TE 220 Weav. & Des. I	5
Basic ROTC or Elect.	1

PO 209 Intr. Am. Govt.	5
PA 202 Ethics & Soc.	5
TE 210 Fiber Process	5
TE 305 Fiber Tech.	3
Basic ROTC or Elect.	1

JUNIOR YEAR

PS 205 Intr. Physics	5
TE 320 Weav. & Des. II	5
+EH 304 Technical Writ.	3
Hum. Soc. Elective	3

PS 206 Intr. Physics	5
TE 307 Bleach. & Dyeing	5
TE 211 Yarn Mfg. I	5
*Hum.-Soc. Elective	3

CH 303 Organic Chem.	5
TE 317 Dyeing & Finish.	5
TE 319 Chem. Testing	2
Technical Elective	5

SENIOR YEAR

CH 304 Organic Chem.	5
TE 405 Warp Preparation	5
TE 412 Textile Mgt.	3
TE 324 Phys. Testing	3

CH 407 Physical Chem.	5
TE 417 Adv. Dyeing	5
TE 424 Man-Made Fibers	5
Technical Elective	3

CH 408 Physical Chem.	5
TE 406 Textile Costing	5
Technical Elective	5

Total — 205 quarter hours

*Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and EH 304 (3 hrs.).

*See page 168 for the selection of Humanistic-Social Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CH 305 Organic Chemistry	5	ME 301 Thermodynamics I	4
CH 404 Organic An. (Qual.)	5	MH 265 Diff. Equa.	3
CHE 432 Proc. Dyn. & Control	5	TE 321 Weav. & Des. III	5
CHE 460 Intr. to Plastics	3	TE 322 Yarn Mfg. II	5
IE 204 Computer Program	3	TE 418 Jacqu. Weav. & Des.	2
IE 311 Engr. Statistics I	3	TE 425 Man-Made Fibers II	5
IE 320 Engineering Economy	5	TE 431 Fabric Analysis	3
ME 207 Stren. of Mat. I	3		

Curriculum in Textile Management (TM)**FRESHMAN YEAR****First Quarter**

EH 101 English Comp.	3
HY 101 World History	3
MH 160 Pre-Calculus w. Trig.	5
TE 101 Intr. Textiles	1
TS 102 Engr. Drawing	2
Basic ROTC or Elect.	1
PE Physical Education	1

Second Quarter

EH 102 English Comp.	3
HY 102 World History	3
MH 161 An. Geom. & Cal.	5
PA 202 Ethics & Soc.	5
Basic ROTC or Elect.	1
PE Physical Education	1

Third Quarter

EH 103 English Comp.	3
HY 103 World History	3
CH 103 Fund. of Chem. I	4
CH 103L Gen. Chem. Lab.	1
IE 201 Ind. Admin.	3
TS 113 Mach. Tool Lab.	1
Basic ROTC or Elect.	1
PE Physical Education	1

SOPHOMORE YEAR

EC 200 Gen. Economics	5
PG 211 Gen. Psychology	5
TE 210 Fiber Process	5
TE 305 Fiber Technology	3
Basic ROTC or Elect.	1

EC 202 Economics II	5
PS 204 Survey Physics	5
TE 220 Weav. & Design	5
LY 101 Use of Library	1
Basic ROTC or Elect.	1

ACF 215 Fund. Acctng.	5
PO 209 Intr. Am. Govt.	5
TE 211 Yarn Mfg. I	5
Basic ROTC or Elect.	1

JUNIOR YEAR

EC 274 Bus. & Eco. Stat. I	5
TE 307 Bleach. & Dyeing	5
TE 322 Yarn Mfg. II	5
TE 319 Chem. Testing	2

MN 207 El. Data Proc.	5
TE 320 Weav. & Des. II	5
TE 324 Phys. Testing	3
†EH 304 Technical Writ.	3

MT 331 Marketing	5
TE 317 Dyeing & Finish.	5
TE 321 Weav. & Des. III	5
TE 325 Tex. Qual. Cont.	2

SENIOR YEAR

EC 445 Indus. Relat.	5
†SC 202 App. Sp. Comm.	3
TE 406 Text. Costing	5
Technical Elective	5

MN 442 Personnel Mgt.	5
TE 405 Warp Preparation	5
Technical Elective	5

TE 424 Man-Made Fibers	5
TE 412 Textile Mgt.	3
TE 431 Fabric Analysis	3
TE 418 Jacqu. Weav. & Des.	2
Technical Elective	5

Total — 204 quarter hours

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and EH 304 (3 hrs.).

*See page 168 for the selection of Humanistic-Social Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

ACF 212 Principles of Acctng.	5	IE 310 Motion & Time Study	5
MN 341 Business Law	5	IE 320 Engineering Economy	5
EC 350 Labor Economics	5	TS 308 Gages and Measurements	5
ACF 361 Prin. of Bus. Finance	5	PG 461 Industrial Psychology	5
MN 480 Bus. Pol. & Admin.	5	TE 330 Survey of Knitting & Tuft	5
HE 415 History of Textiles	5	TE 417 Advanced Dyeing	5
IE 302 Prod. Cont. Techniques	3	TE 425 Man-Made Fibers II	5

School of Home Economics

NORMA H. COMPTON, *Dean*

HOME ECONOMICS at Auburn University is a professional program with its roots in the arts, sciences and humanities. Areas of specialization are concerned with all aspects of environment, health and human development. Home Economics is a complex of studies serving many purposes — broad liberal education for the unknown future, preparation for professional careers, and a background for home and family living. A basic core of subjects in liberal education is required of all undergraduate majors. All courses are open to both men and women students.

With emphasis on both breadth of knowledge and its application to the solution of human problems, Home Economics offers professional or pre-professional preparation for an increasing variety of positions. The Home Economics degree enables graduates to earn above-average salaries. Numerous positions of leadership are offered to majors in education, business, industry, and government.

Programs

Programs of study leading to the Bachelor of Science degree can be planned within nine curricula in the School of Home Economics. These curricula are designed with flexibility to meet the needs of students with varying interests.

Each student is assigned a faculty adviser under whose guidance a program is planned.

The School of Home Economics includes the Departments of Consumer Affairs, Family and Child Development, and Nutrition and Foods.

Department of Consumer Affairs

The Department of Consumer Affairs focuses on man's physical environment and resources, including his personal interaction with this environment. The housing in which he lives, the home furnishings and equipment surrounding him, the clothes he wears, and the beauty in his environment are all matters of fundamental concern.

Three majors are currently offered in this department: Clothing, Textiles and Related Art; Fashion Merchandising; Housing, Interior Furnishings, and Equipment. Students are trained to apply science and technology in evaluating consumer products. This training, in addition to providing better consumers, leads to careers for men and women in business or government positions serving consumers in fields such as fashion merchandising, textile design, textile science, and public utilities.

Clothing, Textiles and Related Art (CT)

Clothing, Textiles, and Related Art is a professional option curriculum (consisting of three options), providing flexibility for preparation in specific areas of specialization based on students' professional goals. Diversification within the major allows for application of knowledge in such varied fields as textile and apparel design, production and promotion; textile science; fashion journalism; consumer problems; and individual creativity. A unique interdisciplinary potential is created by the existence on one campus — located within a textile area — of Clothing and Textiles, Textile Engineering, the Experiment Station for research and the Cooperative Extension Service for consumer application.

Curriculum in Clothing, Textiles and Related Art (CT)

Options: Clothing, Textile Design, Textile Science

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
EH 101 English Comp. _____ 3	EH 102 English Comp. _____ 3	EH 103 English Comp. _____ 3
HY 101 World History _____ 3	HY 102 World History _____ 3	HY 103 World History _____ 3
MH 159 Pre-Cal. w/o Trig. _____ 5	CH 103 Gen. Chem. _____ 4	CH 104 Gen. Chem. _____ 4
CA 116 Art for Everyday Living I _____ 3	CH 103L Gen. Chem. Lab. _____ 1	CH 104L Gen. Chem. Lab. _____ 1
FCD 110 Contemp. Home Economics _____ 1	CA 115 Clothing & Man. _____ 3	CA 105 Fund. of Clo. _____ 5
PE Physical Education _____ 1	LY 101 Use of Library _____ 1	PE Physical Education _____ 1
	PE Physical Education _____ 1	

SOPHOMORE YEAR

EH 253 English Lit. _____ 3	EH 254 English Lit. _____ 3	SY 201 Sociology _____ 5
PG 211 Psych. I or FED 213 Human Growth and Development _____ 5	NF 112 Nutr. & Man. _____ 3	VM 210 Human Physio. _____ 5
EC 200 Economics I _____ 5	CA 225 Textiles _____ 5	SC 202 App. Sp. Comm. _____ 3
FCD 157 Fam. & Human Dev. _____ 3	CA 113 Housing for Man _____ 3	Elective _____ 5
Prof. Elective _____ 4	Prof. Elective _____ 5	

JUNIOR YEAR

PS 204 or 205 Physics _____ 5	BY 220 Bacteriology _____ 5	CA 345 Creative Crafts _____ 5
JM 315 Ag. Journalism _____ 3	FCD 323 Management for Living _____ 3	or
Prof. Electives _____ 5	Elective _____ 5	CA 385 Creative Weaving _____ 3
	CA 313 Home Furnishings _____ 5	Prof. Electives _____ 15

SENIOR YEAR

Professional Electives _____ 5	CA 415 History of Textiles _____ 5	CA 431 Man-Environment Relations _____ 2
Electives _____ 10	or	Electives _____ 15
	CA 425 History of Cost _____ 5	
	Prof. Electives _____ 13	

Total — 205 quarter hours

CLOTHING OPTION - APPROVED PROFESSIONAL ELECTIVES

CA 205 Family Clothing _____ 3	CA 490 Independent or Field Study _____ 5
CA 206 Garment Structures _____ 3	PG 330 Social Psychology _____ 4
CA 216 Art for Everyday Living II _____ 3	PG 461 Industrial Psychology _____ 5
CA 226 Fashion Sketching _____ 3	SY 203 Cultural Anthropology _____ 5
CA 310 Mass Commun., Fam.-Cons. Serv. _____ 3	SY 305 Culture & Personality _____ 3
CA 316 Fashion Analysis _____ 5	SY 311 Technology & Social Change _____ 5
CA 395 Clothing Design _____ 5	JM 221 Beginning Newswriting _____ 5
CA 405 Costume Draping _____ 5	JM 421 Photo-Journalism _____ 5
CA 455 Flat Pattern Des. _____ 5	
CA 456 Comp. Meth. Apparel Prod. _____ 5	

TEXTILE DESIGN OPTION - APPROVED PROFESSIONAL ELECTIVES

CA 216 Art for Everyday Living II _____ 3	CA 477 Adv. Fabric Design _____ 3
CA 205 Family Clothing _____ 3	TE 418 Jacquard Weaving & Design _____ 2
CA 486 Rug Weaving _____ 3	CA 415 History of Textiles _____ 5
CA 487 Adv. Pattern Weaving _____ 3	CA 435 Textile Testing _____ 5
CA 475 Creative Textile Design _____ 5	CA 490 Independent or Field Study _____ 5
CA 476 Textile Printing _____ 3	

Other Suggested Electives

CA 475 Contemporary Home Furnishings	5	CA 395 Clothing Design	5
CA 305 The House	5	CA 343 Interior Home Problems	5
CA 425 History of Costume	5		

TEXTILE SCIENCE OPTION - APPROVED PROFESSIONAL ELECTIVES

(Minimum of 47 hours to be selected from the following courses)

CA 435 Textile Testing	5	TE 417 Advanced Dyeing	5
CA 475 Creative Textile Design	5	TE 424 Man-Made Fibers I	5
CA 483 Laundry Equip. & Care of Textiles	5	TE 425 Man-Made Fibers II	5
CA 490 Independent or Field Study	5	CH 203 Organic Chem.	5
TE 305 Fiber Tech.	3	CH 207 Organic Chem.	5
TE 307 Bleaching & Dyeing	5	CH 208 Organic Chem.	5
TE 317 Dyeing & Finishing	5	PS 205 Intro. Physics	5
TE 319 Chem. Testing	2	PS 206 Intro. Physics	5
TE 324 Physical Testing	3	BY 401 Statistics	5

Students with other specialized professional goals in Clothing, Textiles and Related Art should plan an appropriate coordinated program of electives to provide needed knowledge and competence.

Students interested in combining Clothing & Textiles with teacher certification, consult adviser for specific course requirements.

All electives must be approved by the student's adviser.

Fashion Merchandising (FM)

Fashion Merchandising prepares majors for such positions as buyer or assistant buyer, comparison shopper, fashion stylist or coordinator, merchandise manager, fashion promoter, or owner-manager of a small store. Three months of retail training is included in the fashion merchandising curriculum.

Curriculum in Fashion Merchandising (FM)

FRESHMAN YEAR

First Quarter

EH 101 English Comp.	3
HY 101 World History	3
MH 159 Pre-Cal. w/o Trig.	5
CA 116 Art for Everyday	3
FCD 110 Contemporary	1
H. Ec.	1
PE Physical Education	1

Second Quarter

EH 102 English Comp.	3
HY 102 World History	3
CH 103 Chemistry	4
CH 103L Chemistry Lab.	1
CA 115 Clothing & Man.	3
LY 101 Library Science	1
PE Physical Education	1

Third Quarter

EH 103 English Comp.	3
HY 103 World History	3
CH 104 Chemistry	4
CH 104L Chemistry Lab.	1
NF 112 Nutrition & Man.	3
FCD 157 Fam. & Human	3
Dev.	3
PE Physical Education	1

SOPHOMORE YEAR

EH 253 English Lit.	3
EC 200 Economics I	5
CA 205 Family Clothing	3
VM 210 Physiology	5
Elective	3

EC 202 Economics II	5
CA 225 Textiles	5
SY 201 Sociology	5
CA 113 Housing for Man.	3

ACF 211 Accounting	5
PS 204 Physics	5
PG 211 Psychology I	5
SC 202 App. Sp. Comm.	3

JUNIOR YEAR

MT 331 Marketing	5
CA 226 Fash. Sketch.	3
JM 315 Agric. Journ.	3
Prof. Electives*	8

CA 316 Fash. Analysis	5
FCD 323 Mgt. for Mod. Liv.	3
BY 220 Bacteriology	5
MT 433 Retail Store Mgt.	5

CA 325 Fash. Merch.	5
MT 432 Promotional Strat.	5
Prof. Elective*	5
Elective	3

SENIOR YEAR

CA 335 Retail Training	8
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CA 435 Textile Testing	5
CA 416 Apparel Qual. Eval.	5
Electives	8

CA 425 History of Cost.	5
CA 431 Man-Env. Rel.	2
Prof. Electives*	12

Total — 205 quarter hours

*Professional Electives—10 of the 25 hours should be selected from among CA 105, 206, 385, 475, 483. Other suggested professional electives are ACF 212; any CA courses; EC 206, 274; MN 310, 341, 342, 346, 442; MT 436, 437, 441; SY 405.

Fashion Institute of Technology One-Year Transfer Program

Selected students in the Clothing, Textile Design, or Fashion Merchandising curricula may apply for a special one year program during their junior

year at the Fashion Institute of Technology in New York City. Arrangements can be made to transfer the FIT credits to Auburn and to receive, in addition, the Associate in Applied Science degree from FIT.

The support received by FIT from the Educational Foundation for the Fashion Industries and its unique location in mid-town Manhattan enable students to see the fashion industry in operation and to have their work evaluated by outstanding designers who lecture, demonstrate, and evaluate the finished products. Students in fashion buying and merchandising also participate in a cooperative work-study program in the fashion industry.

For further information, contact the Head of the Consumer Affairs Department, Auburn University.

Housing, Interior Furnishings, and Equipment (HEQ)

The Housing, Interior Furnishings, and Equipment program prepares students for positions with public utilities, manufacturers, retail dealers, research centers, governmental agencies, retail associations, and other business areas. This curriculum serves and prepares professional homemakers, those engaged in adult education and Cooperative Extension. Courses from this program may be elected by students in other curricula; examples include programs centered on safety education, house structure, engineering and the applications of physics.

Curriculum in Housing, Interior Furnishings, and Equipment (HEQ)

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
EH 101 English Comp. _____ 3	EH 102 English Comp. _____ 3	EH 103 English Comp. _____ 3
CA 116 Art for Everyday _____ 3	CH 103 General Chemistry _____ 4	CH 104 General Chemistry _____ 4
Liv. _____ 3	CH 103L Chemistry Lab. _____ 1	CH 104L Chemistry Lab. _____ 1
MH 159 Pre-Cal. w/o Trig. _____ 5	CA 115 Clothing and Man _____ 3	HY 102 World History _____ 3
FCD 110 Contemp. H. E. _____ 1	HY 101 World History _____ 3	FCD 157 Family and Human _____ 3
NF 112 Nutrition and Man _____ 3	CA 113 Housing and Man _____ 3	Dev. _____ 3
LY 101 Use of Library _____ 1	PE _____ Physical Education _____ 1	SC 202 App. Sp. Comm. _____ 3
PE _____ Physical Education _____ 1		PE _____ Physical Education _____ 1

SOPHOMORE YEAR

EH 253 English Lit. _____ 3	EH 254 English Lit. _____ 3	EC 202 Economics II _____ 5
HY 103 World History _____ 3	PG 212 Psychology II _____ 3	CA 233 Home Equipment _____ 5
VM 210 Human Physiology _____ 5	PS 204 Foundations of _____ 5	SY 201 Intr. to Sociology _____ 5
PG 211 Psychology I _____ 5	Physics _____ 5	JM 315 Ag. Journalism _____ 3
CA 225 Textiles _____ 5	EC 200 Economics I _____ 5	

JUNIOR YEAR

CA 303 The House _____ 5	CA 333 Lighting Design _____ 5	CA 343 Int. Home Probs. _____ 5
FCD 323 Mgt. for Mod. Liv. _____ 3	BY 220 Intr. Microbi. _____ 5	Prof. Elective _____ 10
MT 331 Prin. of Mkt. _____ 5	CA 310 Mass Comm. Fam. & _____ 3	
CA 313 Home Furnishing _____ 5	Cons. SVC. _____ 3	
	Prof. Elective _____ 3	

SENIOR YEAR

CA 453 Consum. & Mkt. _____ 5	Prof. Elective _____ 8	CA 431 Man-Envr. Rel. _____ 2
Prof. Elective _____ 10	Electives _____ 8	Prof. Elective _____ 10
		Electives _____ 5

Total — 205 quarter hours

APPROVED PROFESSIONAL ELECTIVES

EQUIPMENT OPTION

16 hours from:	CA 433, 435, 483, 493; NF 104
10 hours from:	MT 432, 433, 441
15 hours from:	ACF 211; AR 360, 370; AT 105, 113, 181; BT 101, 206; CA 325, 335, 473; EC 206, 446, 455; FCD 443, 463; MN 310, 341, 342, 346, 455; NF 358; PG 461; SY 311.

FURNISHINGS OPTION

13 hours from:	CA 845, 375, 385, 415, 435, 473, 475, 483
10 hours from:	MT 432, 433, 441
18 hours from:	ACF 211; AT 105, 113, 181, 338, 339, 340, 431; CA 216, 325, 335, 476, 486; EC 206, 446, 455; FCD 443, 463; HF 221, 225; MN 310, 341, 342, 346, 455; PG 461; SY 311.

HOUSING OPTION

21 hours from:	FCD 327, 357, 463; NF 358; SY 202, 203, 204, 301, 309, 311, 401, 405, 408
10 hours from:	EC 206, 446, 455, 458, 459; FCD 443; MT 432, 441; PG 461
10 hours from:	AR 360, 370; AT 105, 113, 338, 339, 340, 431; BT 101, 206; CA 493; HF 221.

Department of Family and Child Development

The Department of Family and Child Development is concerned with the processes of growth and development of the individual in his daily living from infancy to old age and with the creation of techniques for facilitating such development. Its primary mission is the promotion of self-fulfillment of individuals and families through maximum utilization of material and human resources.

Three majors are offered in this department: Family and Child Development, Home Management and Family Economics, and Family and Child Services.

Family and Child Development (FCD)

The major in Family and Child Development prepares men and women for professional work with families and individuals of all age levels, with challenging careers in programs for young children and youth, family life education and business. Through the course, Internship in Agencies Serving Children, majors are provided supervised job experience related to their area of interest.

Curriculum in Family and Child Development (FCD)

Options: General Family and Child Development, Maternal and Child Health

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101 English Comp.	3	EH 102 English Comp.	3	EH 102 English Comp.	3
PG 211 Psychology	5	FCD 157 Fam. & Hum. Dev.	3	FCD 107 Pren. & Inf. Dev.	5
BI 101 Prin. Biology	5	BI 104 Bio. Hum. Affairs	5	NF 112 Nutr. for Man	3
FCD 110 Contemp. H.Ec.	1	MH or PA (approved)	5	or	
LY 101 Library Science	1	PE Physical Education	1	*NF 372 Fund. of Nutr.	3
PE Physical Education	1			SC 273 Grp. Prob. Solv.	5
CA 115 Cloth. for Man	3			Through Discussion	5
				PE Physical Education	1

SOPHOMORE YEAR

CA 116 Art Everyday Liv.	3	FCD 267 Grwth. & Dev.	5	FCD 287 Child Cult.	5
HY 101 World History	3	Children	5	Disad. Family	5
SY 201 Sociology	5	HY 102 World History	3	HY 103 World History	3
Approved Prof. Elective	3	Liberal Ed. Elective	5	EC 200 Gen. Economics	5
Free Electives	3	Human Dev. Electives	5	Liberal Ed. Electives	5

JUNIOR YEAR

FCD 317 Adolescent & Family	5	FCD 337 Family Relations	5	FCD 377 Comp. Fam. Life	3
FCD 323 Theor. Home Mgt.	5	Approved Prof. Electives	10	Approved Prof. Electives	7
Approved Prof. Elective	9	Liberal Ed. Electives	5	Free Electives	6

SENIOR YEAR

First Quarter

Second Quarter

Third Quarter

FCD 467 Parent Education	5
FCD 477 Aged & His Fam.	3
FCD 487 Intr. Field Exp.	2
Liberal Ed. Electives	5
Free Electives	2

App. Prof. Electives 15

or	
FCD 497 Directed Field Experience	5
A. Soc. Services	
B. Fam. & Child Dev.	
C. Maternal & Child Health	

FCD 499 Seminar	2
CA 431 Man-Envr. Relations	2
Approved Prof. Electives	5
Free Electives	5

Approved Prof. Electives 10

Total — 205 quarter hours

*For students choosing the Maternal and Child Health Option.

GENERAL FAMILY AND CHILD DEVELOPMENT OPTION—APPROVED PROFESSIONAL ELECTIVES

FCD 208 Physical Health in Early Childhood	2
FCD 304 Dynamics of Marriage	3
FCD 308 Mental Health in Early Childhood	3
FCD 409 Independent Studies	1-3
FCD 417 Guidance of Children	3
FCD 417L Guidance of Children Lab.	2
FCD 437 Learning Experiences for Young Children	3
FCD 437L Learning Experiences for Young Children Lab.	2
FCD 440 Management Problems in the Home	3
FCD 443 Home Management Residence	5
FCD 468 Women's Changing Roles and Potentialities	4
FCD 497 Directed Field Experience	5-10
FCD 447 Lab. Ex. with Young Children	5

NF 558 Community and Family Health	3
SY 202 Social Problems	5
SY 203 Cultural Anthropology	5
SY 204 Social Behavior	5
SY 301 Sociology of the Family	5
SY 304 Minority Groups	5
SY 305 Culture and Personality	5
SY 308 Juvenile Delinquency	5
PG 330 Social Psychology	4
PG 350 Behavior Modifications in Early Childhood	5
PG 433 Personality	4
IED 476 The Exceptional Child	5

Certification in Early Childhood or Secondary Education may be obtained by taking the additional required courses offered for those majors in Elementary or Secondary Education.

MATERNAL AND CHILD HEALTH OPTIONS—APPROVED PROFESSIONAL ELECTIVES

BY 220 Introductory Microbiology	5
FCD 208 Physical Health in Early Childhood	2
FCD 308 Mental Health in Early Childhood	3
FCD 310 Techniques of Interviewing	2
FCD 497 Directed Field Experiences	10

HPR 195 Health Science	3
NF 452 Family Nutrition	5
PG 435 Behavior Pathology	4
VM 220 Human Anatomy and Physiology	5
VM 221 Human Anatomy and Physiology	5

Child Study Laboratories

The Department of Family and Child Development provides laboratories for the study of child development and human relations, two nursery schools for children three to five years of age and two kindergartens for five-year olds. The nursery school meets from 9:00 a.m. to 12 noon. A hot lunch is served to the three-year olds. The kindergarten is in session from 1 to 4 p.m. Children admitted to the child study laboratories are selected from an application list. Applications may be placed with the Department of Family and Child Development when the child is 1½ years old. Children are admitted on an early application basis and laboratory needs.

Home Management and Family Economics (HME)

The Home Management and Family Economics major is designed for students interested in a broad general education in home economics. Professional preparation is offered for positions in consumer economics, family economics, financial counseling, Cooperative Extension Service, home service and other

areas of business, requiring a background in home management and social science. Valuable experience may be gained for graduate study.

Curriculum in Home Management and Family Economics (HME)

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
EH 101 English Comp. 3	EH 102 English Comp. 3	EH 103 English Comp. 3
CA 116 Art Everyday Liv. 3	CA 115 Clothing & Man 3	CA 105 Fund. Cloth. 5
MH 159 Pre Cal. w/o Trig. 5	BI 101 Prin. of Biology 5	BI 104 Bio. Hum./Affairs 5
NF 112 Nutrit. & Man 3	CA 113 Hous. for Man 3	FCD 157 Fam. & Hum. Dev. 3
FCD 110 Contemp. H.Ec. 1	SC 202 App. Sp. Comm. 3	PE Physical Education 1
LY 101 Use of Library 1	PE Physical Education 1	
PE Physical Education 1		

SOPHOMORE YEAR

HY 204 Tech. & Civ. 3	HY 205 Tech. & Civ. 3	HY 206 Tech. & Civ. 3
EH 253 English Lit. 3	EH 254 English Lit. 3	PS 204 Prin. Physics 5
EC 200 Macroeconomics 5	EC 202 Microeconomics 5	SY 201 Sociology 5
NF 104 Food & Nutr. 5	NF 204 Meal Mgt. 5	PG 211 Psychology I 5

JUNIOR YEAR

FCD 267 Growth & Dev. Children 5	SC 273 Group P.S. 5	CA 343 Int. Home Prob. 5
FCD 323 Theory Hm. Mgt. 3	MT 331 Marketing 5	CA 310 Mass. Comm. 3
FCD 337 Fam. Relations 5	CA 333 Light. Design 5	MN 341 Business Law 5
CA 233 Home Equip. 5	Electives 3	FCD 333 Consum. Or. Leg. 5

SENIOR YEAR

CA 453 Consum. & Mkt. 5	FCD 441 Fam. Finance 5	FCD 460 Mgt. Prob. Home 3
FCD 377 Comp. Fam. Life 3	FCD 443 HM Residence 5	CA 493 Home Utility 5
Electives 8	CA 355 Consum. Text. 3	CA 431 Man Env. Relations 2
	Electives 5	Electives 5

Total — 205 quarter hours

Family and Child Services (FCS)

Family and Child Services is a broadly-based curriculum designed to provide students with the relevant knowledge and motivation to undertake graduate professional social work education or to enter employment in human service occupations and professions not requiring graduate education immediately upon receiving their bachelor's degree. A multidisciplinary approach utilizing concepts from anthropology, biology, economics, history, philosophy, political science, psychology, sociology, and human development evokes an integrated view of man and society.

Curriculum in Family and Child Services (FCS)

FRESHMAN YEAR

First Quarter	Second Quarter	Third Quarter
EH 101 English Comp. 3	EH 102 English Comp. 3	EH 103 English Comp. 3
HY 101 World History 3	HY 102 World History 3	HY 103 World History 3
BI 101 Prin. of Biology 5	BI 104 Biology 5	MH 160 Pre-Cal. w. Trig. 5
FCD 157 Fam. & Hum. Dev. 3	FCD 107 Prenatal & Infant Development 5	SC 273 Grp. Prob. Solv. Through Discussion 5
LY 101 Use of Library 1	PE Physical Education 1	PE Physical Education 1
PE Physical Education 1		

SOPHOMORE YEAR

PG 211 Psychology I 5	FCD 267 Growth & Dev. Children 5	FCD 287 Child. Cult. Disad. Family 5
SY 201 Sociology 5	EC 200 Economics 5	SY 203 Cult. Anthropol. 5
FCD 208 Phy. Health in Early Childhood 2	PG 215 Quant. Methods 4	SY 204 Social Behav. 5
MH 161 An. Geom. 5	Elective 3	Elective 3
Elective 3		

JUNIOR YEAR

First Quarter

FCD 317 Adolescent	5
PO 323 Mun. Govt.	5
NF 372 Fund. Nutri.	3
SY 301 Soc. of Family	5

Second Quarter

FCD 337 Fam. Relations	5
PG 330 Social Psych.	4
FCD 323 Theor. Home Mgt.	3
RSY 362 Comm. Org.	5

Third Quarter

SY 406 Intr. Soc. Wel.	5
SY 308 Juvenile Del.	5
FCD 310 Tech. Interview	2
FCD 441 Fam. Fin. Mgt.	5

SENIOR YEAR

FCD 477 Aged & Fam.	3
FCD 467 Parent Ed.	5
FCD 487 Intr. Field Exp.	2
PG 435 Behav. Path.	4
Electives	5

FCD 497 Direct Field Exp.	5
Electives	10

FCD 431 Man-Envir. Rel.	2
FCD 499 Seminar	2
PO 325 Intr. Pub. Admin.	5
Electives	5

Total — 205 quarter hours

Department of Nutrition and Foods

The Nutrition and Foods major is designed for students who have a strong interest in the health, physical growth, and welfare of people, and ability to apply scientific principles to the solution of problems. The sociological, psychological, physiological and economical aspects of food on nutritional status are intricate parts of the program.

Through its majors in Nutrition and Foods, Food Service Administration, and Pre-Nursing Science, this department prepares students for careers in teaching, research, and health services in college, university, community, hospital, industry, and in government on the local, state, national and international level.

Food Service Administration (FSA)

The Food Service Administration major trains men and women to manage efficiently commercial, industrial, and institution food service operations. Food production, consumption and service is today the second largest business in the world and demands highly trained personnel.

Curriculum in Food Service Administration (FSA)

FRESHMAN YEAR

First Quarter

EH 101 English Comp.	3
HY 101 World History	3
LY 101 Use of Library	1
NF 112 Nutr. & Man	3
*MH 159 or 160 Math	5
†Basic ROTC	
or	
Elective — women	1
PE Physical Education	1

Second Quarter

EH 102 English Comp.	3
HY 102 World History	3
CH 103 Gen. Chemistry	4
CH 103L Chem. Lab.	1
NF 104 Prin. of Food Prep.	5
LY 101 Library Science	1
†Basic ROTC	
or	
Elective — women	1
PE Physical Education	1

Third Quarter

EH 103 English Comp.	3
HY 103 World History	3
CH 104 Gen. Chem.	4
CH 104L Chem. Lab.	1
NF 204 Meal Manag.	5
†Basic ROTC	
or	
Elective — women	1
PE Physical Education	1

SOPHOMORE YEAR

CH 203 Organic Chem.	5
EC 211 Accounting	5
PG 212 Psychology I	3
EH 253 English Lit.	3
†Basic ROTC	
or	
Elective — women	1

EC 200 Economics I	5
SY 201 Intr. Socio.	5
PS 204 Physics	5
†Basic ROTC	
or	
Elective — women	1

EC 202 Economics II	5
SC 202 App. Sp. Comm.	3
VM 210 Physiology	5
†Basic ROTC	
or	
Elective — women	1
Elective	3

JUNIOR YEAR

First Quarter

IE 301 Elec. Data Pro.	5
EH 301 Creative or	
EH 304 Technical Writing	3
NF 356 Inst. Org. & Personnel Mgt.	5
**Elective	5

Second Quarter

BY 220 Bacteriology	5
MN 341 Business Law	5
NF 372 Fund. of Nutr.	3
Elective	5

Third Quarter

MT 331 Prin. of Mkt.	3
EC 333 Salesmanship	3
NF 362 Prob. in Comm. Nutrition	3
**Elective	6

SENIOR YEAR

First Quarter

AH 310 Meat & Meat Products	3
MT 432 Advertising	3
Elective	10

Second Quarter

ADS 415 Food Plant San.	3
NF 426 Food Pru. & Fin. Mgt.	5
NF 446 Catering	3
NF 462 Exp. Foods	5

Third Quarter

NF 416 Quantity Food Production	5
NF 436 Food Ser. Sys.	5
Elective	5
CA 431 Man-Envr.	2

Total — 205 quarter hours

‡Male students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*MH 159 Pre-Cal w/o Trig; MH 160 Pre-Cal. w. Trig.

**To qualify for ADA membership through therapeutic and administrative dietetics, students will be required to take NF 318 Nutritional Biochemistry, NF 382 and 392 Nutrition and Diet, NF 402 Diet Therapy, PG 212 Psychology II.

Nutrition and Foods (NF)

Studies in Nutrition and Foods offer specialization for a professional career consistent with the interest and ability of the student. Major areas of concentration include dietetics, nutrition and experimental foods with minors in food science, teaching, chemistry, biology, journalism, radio, and television and others from which a student may select.

Curriculum in Nutrition and Foods (NF)

FRESHMAN YEAR

First Quarter

EH 101 English Comp.	3
HY 101 World History	3
LY 101 Use of Library	1
*MH 159 or 160 Math	3
NF 112 Nutr. & Man	3
FCD 110 Cont. Home Ec.	1
PE Physical Education	1

Second Quarter

EH 102 English Comp.	3
HY 102 World History	3
CH 103 Gen. Chemistry	2
CH 103L Gen. Chem. Lab.	1
NF 104 Prin. of Food Prep.	5
PE Physical Education	1

Third Quarter

EH 103 English Comp.	3
HY 103 World History	3
CH 104 Gen. Chemistry	4
CH 104L Gen. Chem. Lab.	1
PE Physical Education	1

SOPHOMORE YEAR

CH 203 Organic Chem.	5
NF 204 Meal Mgt.	5
SY 201 Intr. Socio.	5
CA 113 Housing for Man	3

EC 200 Economics I	5
PG 212 Psychology	3
EH 253 English Lit.	3
PS 204 Physics	5

NF 318 Nutr. Biochem.	5
VM 210 Physiology	5
FCD 157 Family and Human Dev.	3
SC 202 App. Sp. Comm.	3

JUNIOR YEAR

FCD 323 Mgt. for Mod. Liv.	3
NF 356 Inst. Org. & Pers. Mgt.	5
FED 214 Psycho. Fd. of Ed.	5
Prof. Elective	5

BY 220 Bacteriology or	
BY 300 Gen. Microbiology	1.5
SY 220 Statistics or	
BY 401 Biolog. Stats.	5
Prof. Elective	8

EH 301 Creative Writing or	
EH 304 Technical Writing	3
JM 315 Ag. Journalism	3
Prof. Elective	15

SENIOR YEAR

First Quarter		Second Quarter		Third Quarter	
NF 382	Nutr. & Dietetics I 5	NF 392	Nutr. and Dietetics II 5	NF 416	Qty. Food Production 5
	Prof. Elective 13	NF 464	Exp. Foods 5		Prof. Elective 8
			Prof. Elective 6	CA 431	Man Envirn Rel 2

Total — 205 quarter hours

*MH 159 Pre-Cal. w/o Trig.; MH 160 Pre-Cal. w. Trig.

Special areas of interest in Nutrition, Dietetics, Food Science, Communication in Food & Nutrition, Research, and Teacher Education may be developed through choice of elective courses.

NUTRITION AND FOODS OPTIONS—APPROVED PROFESSIONAL ELECTIVES

General Dietetics		Therapeutic and Clinical Dietetics	
NF 436	Food Service Systems 5	SY 203	Cultural Anthropology 5
NF 402	Diet Therapy 5	NF 402	Diet Therapy 5
SY 203	Cultural Anthropology 5	VM 425	(or 220 and 221) Advanced Physiology 5
Management		Community Nutrition	
EC 202	Economics II 5	SY 203	Cultural Anthropology 5
EC 350	Labor Economics 5	NF 402	Diet Therapy 5
MN 310	Principles of Management 5	NF 358	Community and Family Health 3
MN 442	Personnel Management 5	NF 362	Community Nutrition 3
NF 426	Food Purchasing and Financial Management 5	NF 436	Food Service Systems 5
NF 436	Food Service Systems 5		

FOODS OPTION—APPROVED PROFESSIONAL ELECTIVES

CH 105	Fundamentals of Chem. 3	CH 316	Physical Chemistry (or equivalent) 5
CH 105	Lab (Qualitative Analysis) 2	NF 324	Food Preservation 3
CH 204	Analytical Chemistry 3	HF 343	Food Analysis and Quality Control 5
CH 204	Lab (Analytical Chem) 2	DH 410	Food Microbiology 5
AH 310	Meat & Meat Products 3		

NUTRITION AND FOODS RESEARCH AND GRADUATE STUDY—APPROVED PROFESSIONAL ELECTIVES

BI 101	Biology 5	MH 161-62-63	Analytical Geometry and Calculus 5-5-5
BI 104	Human Biology 5	BY 401	Biological Statistics 5
CH 105	Fundamentals of Chem. 5	NF 402	Diet Therapy 5
CH 204	Analytical Chemistry 5		

Pre-Nursing Science (NS)

Pre-Nursing Science provides Nursing Science majors with a basic two-year program. Upon satisfactory completion, students will be assisted with transfer to an accredited School of Nursing for completion of the baccalaureate program in nursing. The Emory University, the University of Alabama, and other accredited schools of nursing have approved this program as meeting their pre-nursing requirements.

Curriculum in Pre-Nursing Science (NS)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101	English Comp. 3	*BI 101	Biology 4	EH 105	English Comp. 3
*HY 101	World History 3	*BI 101L	Biology Lab. 1	*BI 104	Human Bio. 5
CH 103	Gen. Chem. 4	EH 102	English Comp. 3	or	
CH 103L	Chem. Lab. 1	CH 104	Gen. Chem. 4	**VM 220	Human Anat. & Physiology 5
†MH 159 or 160	Math 5	CH 104L	Chem. Lab. 1	SC 202	App. Sp. Comm. 3
		PO 209	Intr. to American Government 5	CH 203	Organic Chem. 5

SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
SY 201 Intr. Socio.	5	**PS 204 Physics	5	FCD 207 Prenatal & Infant	
PG 212 Psych.	3	PG 212 Psych. II	3	Development	3
**VM 221 Human Anat. &		EH 254 English Lit.	3	FED 214 Psycho. Fd. of Ed.	5
Physiology	5	**BY 300 Gen. Microbiol.	5	**NF 318 Biochem.	5
EH 253 English Lit.	3	FCD 304 Home & Family	3	PG 330 Soc. Psy.	4
NF 372 Fundamentals of		Life			
Nutrition	3				

*Courses required by only Emory University, School of Nursing. A total of 90 quarter hours required for admission. Remaining hours are to be selected from approved electives.

**Courses required by only the University of Alabama, School of Nursing.

†MH 159 Pre-Cal. w/o Trig; MH 160 Pre-Cal. W. Trig.

Dual Objective Program with the School of Education

Teacher Education: Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Home Economics to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and curriculum requirements in the School of Home Economics in any one of five areas, the Dean of the School of Education will recommend to the State Department of Education that the appropriate professional certificate be issued. The five majors within the dual objective program are as follows:

Family Life and Early Childhood Education
Clothing, Textiles and Related Art
Nutrition and Foods
Home Management and Family Economics
Housing and Equipment

It is considered desirable for students who wish to engage in junior high or high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the School of Home Economics. The advisers will counsel in their respective areas. Flexibility in scheduling student course requirements is to be permitted in the pursuit of the requirements for both the Home Economics curricula and Teacher Education training.

Option in Cooperative Extension

Students enrolled in any of the majors in the School of Home Economics may prepare for a career in the Cooperative Extension Service through selection of certain courses as electives. The major of Home Management and Family Economics meets the requirements of this option. Other majors may also fulfill the requirements of the Cooperative Extension Service through scheduling of the following courses.

NF	CA	FCD
104	105	307
204	233	323
324	343	463
372	AS 441	467
362	or VED 413	
	355 or 225	
	453	
	493	

GRADUATE WORK

The School of Home Economics offers work leading to the Master of Science degree, Master of Arts in College Teaching degree, and the Ph.D. degree in Experimental Nutrition, an interdepartmental program.

School of Pharmacy

SAMUEL TERRY COKER, *Dean*

THE SCHOOL OF PHARMACY is a member in good standing of the American Association of Colleges of Pharmacy, which promotes pharmaceutical education. It is also fully accredited by the American Council on Pharmaceutical Education, which formulates the educational, scientific and professional principles and standards which approved Schools of Pharmacy are required to meet and maintain.

Careers in Pharmacy

The thorough academic background provided by the five-year curriculum prepares students to pursue a variety of careers. Excellent opportunities exist in community pharmacy, hospital pharmacy, industrial pharmacy, (research, product development, analytical control and product manufacture, sales and distribution), wholesale pharmacy, public health, Food and Drug Administration, toxicology, and research and teaching after further education. Pharmacy, especially hospital pharmacy, offers outstanding opportunities for women. Many opportunities exist in each of these areas for the pharmacist of the future.

Curriculum in Pharmacy (PY)

Admission Requirements

The curriculum in pharmacy prepares students for licensure by the pharmacy boards of states as well as for careers in those areas of pharmacy not requiring registration.

The entrance requirements of the School of Pharmacy may be satisfied by completion of the six quarter pre-pharmacy curriculum as outlined on page 111. Any or all of these requirements may be met by transfer of credit from other institutions. A minimum grade point average of 1.00 (based on all courses attempted) is required for successful completion of the pre-pharmacy curriculum.

The student must make application to the Pharmacy Admissions Committee for determination of eligibility. Special application forms are available from the School of Pharmacy and the University Office of Admissions. A transfer student must submit an application to the Pharmacy Admissions Committee at least 30 days prior to the expected date of admission. This application is in addition to the one required for admission to the University. Students on the Auburn campus should follow the schedule suggested by the pre-pharmacy adviser. Transfer students from junior colleges may receive no more than 108 quarter hours credit (equal to two years of pre-pharmacy).

Attention is called to the following regulation of the American Association of Colleges of Pharmacy: "No student may graduate from a recognized college

or school of pharmacy who has spent less than three scholastic years of nine quarters or six semesters in residence at said school or college."

A candidate for the Bachelor of Science in Pharmacy degree must complete 20 hours in the areas of Humanities and Social Sciences (Group I) with a minimum of 12 hours in courses of at least sophomore level in one and a minimum of 8 hours in courses of at least sophomore level in the other of these two general areas. Some of the courses included in these two areas are required for the Bachelor of Science in Pharmacy degree and may be scheduled any time prior to the third professional year. It is recommended that these required courses be scheduled early in order to avoid possible scheduling difficulties.

In addition to the 20 hours required in the areas of Humanities and Social Sciences, a student may complete his remaining elective requirement in these two areas or in the areas of Mathematics and Natural Science (Group II).

Curriculum Options

After admission to the School of Pharmacy students may choose either a professional option in preparation for general practice, including hospital pharmacy, or a specialized option in preparation for industry, research or teaching. The program of each student under either option must be approved by the adviser and those choosing a specialized option must also be approved by the Dean. Both options will adequately prepare students for State Board examinations. It is hoped that these options will motivate the superior student to achieve an educational level consistent with his ability and interests.

Electives should be chosen according to the interests of the student and approved by the adviser.

Students who are qualified and have the prerequisites may take up to 10 hours of graduate courses in their fifth year. Such work cannot be applied toward both the undergraduate and graduate degrees. Registration in graduate courses must be approved by the Dean of the Graduate School.

Scholarships and Loans

Information concerning available scholarships and loans may be obtained from the Director of Student Financial Aid, or the Dean, School of Pharmacy.

Continuing Education and Extension Services

Continuing education and extension services programs are available to Alabama pharmacists. The rapid advancements being made in the pharmaceutical sciences make it imperative to bring new knowledge and refresher courses to the pharmacist in or near his home. Meetings are held throughout the year, enabling Alabama pharmacists to avail themselves of the educational programs. Faculty members of the School, as well as practicing pharmacists and leaders in industry and in state and federal governmental agencies, serve as instructors.

Curriculum in Pharmacy (PY)

FIRST PROFESSIONAL YEAR*

First Quarter		Second Quarter		Third Quarter	
PY 100 Convocation**	0	PY 100 Convocation	0	PY 100 Convocation	0
PY 306 Pharmacognosy I	5	PY 201 Inorganic Phar. Chem.	5	PY 102 Phar. Math	3
PY 205 History of Pharmacy	3	BY 300 Microbiology	5	PY 203 Organic Phar. Chem. I	5
CH 301 Biochemistry	5	CH 302 Biochemistry	4	BY 302 Medical Microbiology	5
EC 200 General Economics	5	ACF 211 Intr. Accounting	5	ZY 424 Animal Physiology	5

SECOND PROFESSIONAL YEAR

PY 100 Convocation	0	PY 100 Convocation	0	PY 100 Convocation	0
PY 301 Phar. Tech. I	5	PY 303 Phar. Tech. II	5	PY 304 Phar. Tech. III	5
PY 405 Pharmacology I	5	PY 406 Pharmacology II	5	PY 407 Chemotherapeutic Drugs	5
PY 302 Organic Phar. Chem. II	5	***PY 307 Pharmacognosy II	5	PY 404 Chemistry of Natural Product	5
		Elective	3		

THIRD PROFESSIONAL YEAR

PY 100 Convocation	0	PY 100 Convocation	0	PY 100 Convocation	0
PY 400 Professional Practice I	5	PY 401 Professional Practice II	5	PY 402 Professional Practice III	5
PY 416 Drug Marketing	3	PY 415 Phar. Jurisprudence	3	or	
Elective	5	***Professional Elective	5	PY 411 Elements of Phar. Mfg.	5
****Professional Elective	5	Elective (Group II)	5	PY 428 Public Health	5
				***PY 408 Pharmacy Mgt.	5

Total — 152 quarter hours

*Options may be chosen at the beginning of the Second Professional Year.

**Required of all Pharmacy students each quarter.

***With consent of the adviser and approval of the Dean, those electing the specialized option may substitute courses of equal credit for these subjects.

****Any elective course offered by the School of Pharmacy.

NOTES: 1. Proficiency in typing is required for admission to the fifth year.

2. Students are expected to participate in field trips to a pharmaceutical manufacturing plant during their junior or senior year, and to a wholesale drug company during their senior year.

3. A set of Class C metric and Apothecaries' weights, which may be purchased from Pharmacy Supply, is required for all Pharmacy laboratories.

Group I Electives: Courses in Departments of English, Foreign Language*, Speech Communication, Philosophy, Music, Drama and Art, Psychology, Sociology, Economics, Business Administration, Geography, History, and Political Science.

Group II Electives: Courses in Departments of Mathematics, Chemistry, Physics, Animal Science, Poultry Science, Veterinary Medicine, Botany, Zoology, and Pharmacy.

*Ten hours must be completed in one language for credit.

RECOMMENDED ELECTIVES

Group I: SC 202, PG 211, PG 212, EH 214, EH 253, EH 254, any Foreign Language (2 quarters of one language required for credit), PA 210, PA 211, PA 212, HY 201, HY 202, EC 201, EC 212, MN 341.

Group II: MH 162, MH 163, MH 264, MH 367, IE 204, BY 401, ZY 300, ZY 301, ZY 302, PY 202, PY 305, PY 308, PY 432. Any course in Groups I or II of 300 level or higher may be considered as a suitable elective.

School of Veterinary Medicine

J. E. GREENE, *Dean*

NELSON KING, *Assistant Dean*

H. C. MORGAN, *Director of Continuing Education and Learning Resources*

THE SCHOOL OF VETERINARY MEDICINE offers a fully accredited program of training leading to the degree of Doctor of Veterinary Medicine. The curriculum requires four years in the professional school after completion of at least seven quarters of the pre-professional course.

Specific Information

Admission

Seven quarters of general college work, with a minimum honor point average of 1.25 on all courses attempted and on all required courses is required for admission. A grade of D on any required course will not be accepted. The Committee on Admissions of the School of Veterinary Medicine may require a personal interview with any applicant and may also require a reading comprehension test, or an examination on any required course. The School of Arts and Sciences offers the Pre-Veterinary Medicine Curriculum which is available to residents of Alabama. Although farm experience is not a requirement for admission, applicants are urged to gain such experience. Students without farm knowledge frequently have difficulty with certain courses, particularly in the clinical areas. In addition, students contemplating Veterinary Medicine as a career are advised, though not required, to elect some foreign language study (preferably Latin, French or German) in their pre-professional curricula. Applications for admission to the pre-veterinary course should be made directly to the Admissions Office, Auburn University.

Residents of states other than Alabama should complete the pre-professional requisites at institutions within their home state since they are not eligible for admission to the pre-professional curriculum at Auburn University.

Minimum Requirements for Pre-Veterinary Medicine:

General Requirements

1. Completion of the liberal education program as stated on page 65 of this bulletin.

Specific Requirements

2. General Chemistry	8-12 quarter hours
Organic Chemistry	8-12 quarter hours
Physics	8-12 quarter hours
Mathematics	Through Introductory Calculus
Biological Science	8-12 quarter hours
Animal Biochemistry,	
Nutrition, Feeds & Feeding	8-12 quarter hours
Genetics	4-6 quarter hours
General Microbiology	4-6 quarter hours

Three semester hour courses will be accepted as the equivalent in subject-matter content of five-quarter-hour courses.

Admission to the School of Veterinary Medicine must be gained through formal application not later than February 15 preceding the Fall Quarter in which admission is desired. Preliminary consideration for admission will be based on academic work completed prior to February 15. Final consideration will be based on academic work completed prior to June 15.

Applicants Should Submit the Following

1. Two completed applications for admission on form supplied by Auburn University. All applications must be submitted to the Dean, School of Veterinary Medicine, through proper channels by February 15 preceding admission date. (Only one transcript is required of students formerly enrolled at Auburn University.)

2. Two official transcripts from each college or university attended including high school credits.

3. A list of courses in progress at time of application, if any.

4. Names and addresses of three unrelated persons familiar with the qualifications and character of the applicant.

Those applicants who have not completed all requirements for admission at the time of application must submit by July 1 two supplemental official transcripts of any work completed after application is filed.

If a student is admitted to the School of Veterinary Medicine, he must submit in addition to the above, one completed physical examination report on a form supplied by Auburn University at least three weeks prior to date of registration (not required by students formerly enrolled at Auburn University), and an application processing fee.

The final selection of students is made by the Committee on Admissions of the School of Veterinary Medicine, Auburn University. These selections are made from the applicants who have been certified by the committees in the respective states after giving due consideration to scholastic record and general adaptability for the profession. The right is reserved to accept or reject any applicant. All applications for admission must be on file at the School of Veterinary Medicine by February 15 preceding date of admission.

Microscopes. — In order to be admitted to the School of Veterinary Medicine, students must own a compound microscope acceptable to the faculty.

Students must furnish a microscope in all courses requiring the use of this instrument. Microscopes may be purchased through the Book Store of Auburn University.

Admission under the Regional Plan. — Under the Regional Plan for Veterinary Training, the School of Veterinary Medicine serves six states — Alabama, Florida, Kentucky, Louisiana, Mississippi and Tennessee. While there is no limit on the number of applications, the School's facilities make it necessary to restrict admissions.

The Land-Grant Institution in each state participating under the Southern Regional Education plan maintains counseling and guidance service for students desiring admission to the School of Veterinary Medicine. Students attending other than Land-Grant Institutions of the several states should contact the counseling and guidance service for information and advice concerning courses which will be acceptable in the pre-veterinary curriculum. Inquiries should be made early and addressed to:

Alabama:	Dean, School of Arts and Sciences Auburn University Auburn, Alabama
Florida:	Dean, College of Agriculture University of Florida Gainesville, Florida
Kentucky:	Executive Secretary Council on Public Higher Education State National Bank Building Annex Frankfort, Kentucky
Louisiana:	Head, Department of Veterinary Science Louisiana State University Baton Rouge, Louisiana
Mississippi:	Dean, School of Agriculture Mississippi State University State College, Mississippi
Tennessee:	Dean of Resident Instruction College of Agriculture University of Tennessee Knoxville, Tennessee

The procedure for making application for admission to the School of Veterinary Medicine under the Regional Plan varies in the several states. An officer, or board, in each state certifies applicants as to residence and evaluates the courses completed. Courses acceptable in the degree program at the State Land-Grant Institution will be considered acceptable in the Auburn University pre-veterinary program. An applicant who wishes to be included in his state's list of eligibles for entrance into the School of Veterinary Medicine should send his completed application together with a list of references and transcripts covering all college work completed to the appropriate address as indicated below:

Alabama:	Dean, School of Veterinary Medicine Auburn University Auburn, Alabama
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Florida:	Certification Committee for Regional Education State University System of Florida Office of the Board of Regents Tallahassee, Florida
Kentucky:	Chairman Committee on Regional Veterinary Training University of Kentucky Lexington, Kentucky
Louisiana:	Chairman, Certification Committee Louisiana State University Baton Rouge, Louisiana
Mississippi:	Executive Secretary Board of Trustees for Institutions of Higher Learning State Capitol Jackson, Mississippi
Tennessee:	Committee on Regional Veterinary Training University of Tennessee Knoxville, Tennessee

Scholastic Requirements

All applicants and students in the professional program are subject to the academic and disciplinary regulations of the School of Veterinary Medicine in addition to those of Auburn University.

Any student who earns less than a 1.25 honor point average for any quarter will be placed on academic probation. A student who fails to earn a 1.25 honor point average for any two quarters in the same academic or calendar year may be dropped from the rolls of the School of Veterinary Medicine for scholastic deficiency. A student who makes a grade of "F" on any course may be required to withdraw from the School of Veterinary Medicine until such time as the course is offered again. Such student may be required to repeat certain other courses in the curriculum for that quarter.

The responsibility for counseling is shared by the Faculty of this School and the University Counseling Service.

Required Withdrawal

The faculty of the School of Veterinary Medicine reserves the right to require the withdrawal at any time of any student who in the judgment of the faculty is not profiting or is not likely to profit by the instruction offered, who is neglectful, irregular or indifferent in the performance of required duties and studies, or whose character or conduct is inconsistent with good order of the veterinary school or with the standards of the veterinary profession.

Requirements for Graduation

To be eligible for the D.V.M. degree, candidates must complete all of the required courses in the order listed in the curriculum in veterinary medicine with a minimum over-all honor point average of 1.25.

A graduation fee of \$10.00 must be paid at the beginning of the quarter of graduation and all indebtedness due the institution must be paid prior to graduation.

Curriculum in Veterinary Medicine (VM)

FIRST YEAR

First Quarter

VM 320 Anatomy I	5
VM 326 Histology	5
VM 313 Physiology I	4
VM 313L Physiology Lab I	1
VM 314 Physiology II	2
VM 300 Orientation	2

Second Quarter

VM 321 Anatomy II	5
VM 327 Organology	5
VM 315 Physiology III	4
VM 315L Physiology Lab II	1
VM 316 Physiology IV	2
VM 330 Gen. Microbiology	4

Third Quarter

VM 322 Anatomy III	5
VM 328 Embryology	4
VM 317 Physiology V	3
VM 317L Physiology Lab III	1
VM 318 Physiology VI	2
VM 319 Pharmacology I	1
VM 331 Vet. Micro. I	4

SECOND YEAR

VM 436 Pharmacology II	3
VM 443 Physiology VII	4
VM 450 Pathology I	6
VM 456 Vet. Parasitology I	4
VM 460 Vet. Micro. II	4

VM 437 Pharmacology III	4
VM 444 Physiology VIII	3
VM 451 Pathology II	5
VM 457 Vet. Parasitol. II	5
VM 461 Vet. Micro. III	4

VM 452 Pathology III	4
VM 454 Lab. An. Med.	3
VM 430 Vet. Radiology	3
VM 499 Vet. Med. I	5
VM 465 Public Health I	4

THIRD YEAR

PH 422 Avian Diseases	5
VM 500 Vet. Med. II	5
VM 503 Vet. Surgery I	3
VM 510 Vet. Med. & Surg. I	5
VM 526 Clinics I	1
VM 527 Clinics VI	1

VM 504 Vet. Surg. II	3
VM 507 Clin. Path.	3
VM 511 Vet. Med. & Surg. II	5
VM 542 Applied Anatomy	1
VM 555 Vet. Med. IV	5
VM 579 Public Health II	4
VM 512 Vet. Surgery III	1

VM 519 Vet. Med. & Surg. III	3
VM 550 Theriogenology	4
VM 554 Vet. Med. III	5
VM 556 Vet. Med. V	5
VM 562 Clinics VII	2
VM 566 Clinics II	2

FOURTH YEAR

VM 563 Clinics III	4
VM 567 Clinics VIII	4
VM 572 Vet. Surg. IV	1
VM 582 Seminar I	2
Electives	6

VM 564 Clinics IV	4
VM 568 Clinics IX	4
VM 573 Vet. Surg. V	1
VM 583 Seminar II	1
VM 530 Jurisp. & Ethics	1
Electives	6

VM 565 Clinics V	4
VM 569 Clinics X	4
VM 574 Vet. Surg. VI	1
VM 531 Jurisp. & Ethics	1
Electives	6

Total — 235 quarter hours

Graduate

All departments offer programs through the Graduate School leading to a Master of Science degree. Master's degree candidates may be required to pass a preliminary oral and/or written examination to demonstrate adequate knowledge in their chosen fields. A doctoral program leading to a Doctor of Philosophy degree is offered in Physiology. This is an interdisciplinary program that offers sufficient flexibility to permit students to adapt programs to their individual needs.

Extension

Under the direction of the Vice President for Extension this school provides continuing education programs throughout the year in Auburn and at off-campus sites.

The Graduate School

PAUL F. PARKS, *Dean*

ALL REGULATIONS governing the Graduate School are designed to equal or exceed the minimum standards recommended by the Commission on Colleges and Universities of the Southern Association of Colleges and Schools.

A student with a bachelor's degree from an accredited college or university may apply to the Dean of the Graduate School for admission. Application forms for admission may be secured from the Graduate School and must be submitted at least three weeks before registration. Two transcripts of undergraduate credits and satisfactory scores on the Graduate Record Examinations must also be submitted. Every applicant must have a satisfactory undergraduate record and show adequate preparation in the field in which he desires to major as determined by the screening committee of the department or unit concerned.

The Graduate School bulletin should be consulted for detailed information on the regulations of the Graduate School, the courses offered for graduate credit, the requirements for degrees, fellowships and assistantships, and other matters pertaining to graduate work in this institution. Undergraduates wishing to register for graduate courses should consult the Graduate bulletin for regulations concerning such registration. A bulletin may be obtained upon request from the Dean of the Graduate School.

The Graduate School administers graduate work leading to the degrees listed below.

Graduate Degrees

The Master's Program

Master of Science in the areas of Aerospace Engineering; Agricultural Economics and Rural Sociology; Agricultural Engineering; Agronomy and Soils; Animal Science; Animal Nutrition; Botany and Microbiology; Chemical Engineering; Chemistry; Civil Engineering; Consumer Affairs; Counselor Education; Dairy Manufacturing; Dairy Production; Economics; Educational Administration; Electrical Engineering; Elementary Education; Entomology; Family and Child Development; Fisheries Management; Forestry; Health, Physical Education and Recreation; Horticulture; Industrial Engineering; Mathematics; Mechanical Engineering; Nutrition and Foods; Ornamental Horticulture; Pharmacy; Physics; Poultry Science; Psychology; Secondary Education; Toxicology; Veterinary Medicine; Vocational and Adult Education; Wildlife Management; and Zoology.

Master of Arts in the areas of English; History; Political Science; Spanish; and Speech.

Other Master's Degrees: Master of Fine Arts, Master of Business Administration, Master of Education, Master of Urban and Regional Planning, Master of Arts in College Teaching, Master of Agriculture, Master of Electrical Engineering, Master of Industrial Design, Master of Music, Master of Speech Communication.

The Specialist in Education Program

The degree of Specialist in Education is a sixth-year degree and is offered in Curriculum, Teaching, Administration, Supervision, and Guidance.

The Doctoral Degree Program

The degree of Doctor of Education is offered with specializations in Administration and Supervision, Counselor Education, Elementary Education, Secondary Education, and Vocational and Adult Education.

Doctor of Philosophy in the Departments of Aerospace Engineering, Agronomy and Soils, Animal Science, Botany and Microbiology, Chemistry, Electrical Engineering, English, Fisheries and Allied Aquacultures, Forestry, History, Mathematics, Mechanical Engineering, Physics, Psychology, and Zoology-Entomology, and interdepartmental programs in Agricultural Engineering, Microbiology, Nutrition, and Physiology.

Research Program with the Oak Ridge Associated Universities

Auburn University is one of the sponsoring institutions of the Oak Ridge Associated Universities research program located at Oak Ridge, Tennessee. Through this cooperative association our graduate research programs have at their disposal the facilities of the National Laboratories in Oak Ridge and the research staffs of these laboratories. When advanced degree candidates in certain areas have completed their residence work at Auburn it is possible, by special arrangement, for them to go to Oak Ridge to do their research problems and prepare their theses. In addition, it is possible for our faculty members to obtain appointments on the Oak Ridge Research Participation Program for varying periods, usually not less than three months, in order to pursue advanced studies in their fields of specialization. Thus, both faculty and students may keep abreast of the most modern and up-to-date developments in atomic and nuclear research that is in progress at the Oak Ridge Laboratories.

The students will go to Oak Ridge on Oak Ridge Graduate Fellowships. The stipend will be determined by the number of dependents of the student and by the level of work which he is prepared to do. Faculty members may work in Oak Ridge on stipends commensurate with their current college salary and rank.

Information on the opportunities for research in the Oak Ridge Laboratories is available in the office of the Dean of the Graduate School.

Auburn Computer Center

BEN B. BARNES, Director

The Auburn Computer Center, which is equipped with an IBM 360 model 50 computer, is administered by the Graduate School. Computer time is available for research, instructional, extension, or administrative projects with the endorsement of any University department. However, all researchers are encouraged to obtain external funds to support computer time and associated costs required for their work. Details concerning arrangements for the use of computer services are available in most departments but can also be obtained from the Director of the Computer Center.

Reserve Officers Training Corps

Department of Military Science

COLONEL ANDREW W. LAMAR, JR.
Commandant and Professor of Military Science

STUDY OF MILITARY SCIENCE at Auburn University dates back to the Civil War period. The Morrill Land Grant Act of 1862 requires that military instruction be furnished to students. Instruction in Military Science is under the supervision of an officer of the Active Army who is detailed as Professor of Military Science. By appointment of the college authorities he is Commandant of the ROTC students. The Professor of Military Science is assisted by a staff of commissioned and non-commissioned officers of the Army. The curriculum in Military Science is divided into two courses, basic and advanced. A description of course requirements is discussed in the following paragraphs.

Basic Course

The basic course consists of a six-quarter block of instruction normally taken during the freshman and sophomore years. During the freshman year, two hours of instruction (one classroom and one Leadership Lab) are taken each week for three quarters.

In the sophomore year three hours of instruction (two classroom and one Leadership Lab) are taken each week for three quarters. All freshman and sophomore military science classes are offered Fall, Winter and Spring quarters, with one credit hour being allowed each quarter. Deferments may be granted to basic cadets provided they agree to complete the basic and advanced courses and accept commissions if tendered by the Department of the Army.

Basic Camp

The basic camp consists of six weeks of field training conducted at an Army Post during the summer. Basic Camp is not required for students completing the basic course described above. It is designed for transfer students who wish to substitute the successful completion of the basic camp for the six-quarters resident basic course and enroll in the advanced course. Transfer students may apply to the Professor of Military Science for a draft deferment and enter into an agreement to complete basic camp and the advanced course. While attending basic camp students are paid at the rate of \$124.50 per month. Reimbursement to the student for travel expenses is made at the rate of six

cents per mile to and from camp. Uniforms, quarters, medical care and rations are furnished by the government during the camp period.

Advanced Course

The Advanced Course is designed to produce officers for the Army of the United States, both the Active Army and the Reserve. Successful completion of the Advanced Course at Auburn University qualifies the student for a commission as 2nd Lieutenant in one of the following branches of the United States Army Reserve: Adjutant General's Corps, Air Defense Artillery, Armor, Chemical Corps, Corps of Engineers, Field Artillery, Finance Corps, Infantry, Medical Service Corps, Military Intelligence, Military Police Corps, Ordnance Corps, Quartermaster Corps, Signal Corps, Transportation Corps, based on student's choice and needs of the Army. Students who are designated Distinguished Military Students may apply for a Regular Army commission, if accomplished prior to graduation. Regular Army appointments are contingent upon selection by Department of Army and subsequent designation of the cadet as a Distinguished Military Graduate. The advanced course consists of a six-quarter course, normally taken during the junior and senior years, designed to qualify the student for appointment in any of the aforementioned branches. Three credit hours per quarter or a total of 18 credit hours are granted for completion of the Advanced Course; however, only six credit hours may apply towards total credits required for graduation. Students are paid subsistence pay of \$50.00 per month, not to exceed 600 days while enrolled in the Advanced Course.

An advanced camp of six weeks duration must be attended by the student before he becomes eligible for a commission. Advanced camp is normally attended during the summer between the end of the junior and the start of the senior years. While attending advanced camp students are paid $\frac{1}{2}$ base pay of a second lieutenant (approximately \$250.00). Reimbursement to the students for travel expenses is made at a rate of six cents per mile to and from camp. Uniforms, quarters, medical care and rations are furnished by the government during the camp period. The applicant for the advanced course must:

1. Be a citizen of the United States.
2. Be physically qualified in accordance with standards prescribed by the Department of the Army.
3. Not have reached 28 years of age at time of appointment in the U.S. Army Reserve.
4. Have completed appropriate basic training (2 years basic course or basic camp) or have equivalent military or ROTC training in lieu thereof; have at least two (2) academic years to complete prior to graduation.
5. Have minimum overall academic average of 1.0.
6. Be selected by the Professor of Military Science and the President of Auburn University.
7. Enlist as a private in the U. S. Army Reserve.
8. Execute a written agreement with the Government to complete the two-year Advanced Course training and attend one Summer Camp (six weeks dura-

tion) preferably at the end of the first year of the Advanced Course. Agree in writing to accept an appointment as a commissioned officer in the Army Reserve and serve the prescribed period of duty.

Financial Assistance Program

The Army ROTC offers a scholarship program designed to provide financial assistance to outstanding young men in the program who are interested in the Army as a career. Each scholarship provides for free tuition, textbooks and laboratory fees in addition to pay of \$50 per month for the period that the scholarship is in effect. During a six-week summer training period, normally at the end of the junior year, this pay is increased to one-half of a second lieutenant's base pay. The scholarships are provided under provisions of Public Law 88-647, The ROTC Vitalization Act of 1964.

Scholarships may be awarded for periods of one, two, three or four years. Four year scholarships are awarded to selected high school applicants who plan to attend a University offering Army ROTC in its curricula.

Three and two year scholarships are awarded to selected applicants enrolled in freshmen and sophomore military science who are qualified to enter the advanced program.

The one year scholarship is awarded to selected junior applicants who have enrolled in advanced ROTC and have demonstrated outstanding leadership potential.

Recipients of Army ROTC scholarships agree to serve on active duty as a commissioned officer for a four year period. The remainder of the normal six year service obligation may be spent in the U. S. Army Reserve.

Army ROTC Aviation Program

Qualified second year advanced (MS IV) cadets may apply for enrollment in the Army ROTC Flight Training Program, subject to quota limitations. This program is conducted at no expense to the student. Participation in the program will not act to cause any reduction in the prescribed MS IV course. This course is an approved Federal Aviation Agency standardized flight instruction program consisting of 35 hours ground instruction and 36½ hours flight training. Satisfactory completion of the program of instruction may qualify the graduates for award of a FAA Private Pilot's certificate. Students must agree to a period of active duty for three years after completion of additional flight training in the active service.

Uniforms and Equipment

All students are required to deposit \$30.00 with the Bursar of the University prior to enrollment in the ROTC. They are furnished a uniform in good condition and other necessary supplies through the ROTC Supply Office. Upon completion of the course of instruction, or upon withdrawal, the uniform and other supplies are turned in and the deposit less \$1.50 per quarter is returned to the student.

Advanced ROTC students are furnished uniforms under the commutation system. Upon graduation, the uniform becomes the property of the advanced student.

Distinguished Military Students

The Professor of Military Science may designate as a Distinguished Military Student a person who:

1. Possesses outstanding qualities of leadership, high moral character, and definite aptitude for the military service.
2. Has attained an academic standing in the upper half of his class. An exception may be made only in the case of an individual student whose standing is in the upper 10 per cent of his class in military subjects, or who has shown exceptionally high motivation toward a military career.
3. Has demonstrated his leadership ability through his achievements while participating in recognized campus activities.
4. Has attained a class standing in the upper third of his ROTC class in the Advanced Course, Senior Division, ROTC.

Distinguished Military Students may make application for a commission in the Regular Army any time subsequent to such designation, but not later than the date on which they are designated Distinguished Military Graduates. If accepted they will be commissioned in the Regular Army upon graduation.

Distinguished Military Graduates

The professor of Military Science may designate as a Distinguished Military Graduate a person who was designated a Distinguished Military Student and who has maintained the high academic standards between the time of such designation and date of commission and graduation.

Selective Service Deferments

Students enrolled in the basic or advanced course, Army ROTC, will be deferred under the provisions of the Universal Military Training and Service Act, as amended, according to the following:

1. The students are required to sign an ROTC deferment agreement. The provisions of the agreement require the students to complete the advanced course and to accept commissions if tendered by the Department of the Army.
2. The Professor of Military Science will notify the local selective service boards of all enrolled students of their selection for deferment. Deferment by the local selective service board is mandatory unless the student has received an order to report for induction.

Students enrolled in the basic course, Army ROTC, may request the Professor of Military Science to select them for deferment. The students are required to sign an ROTC deferment agreement. The provisions of the agreement require the students to complete the basic and advanced courses and accept commissions if tendered by the Department of the Army.

Deferred students dropped from ROTC, not in good scholastic standing, or not considered potential commissioned officers, will no longer be deferred. Students who decline to fulfill the terms of their ROTC deferment agreements pertaining to undergraduate work at the institution will be reported to Selective Service.

Department of Naval Science

CAPTAIN D. A. BARKSDALE, USN

Commanding Officer and Professor of Naval Science

THE NAVAL RESERVE OFFICERS TRAINING CORPS is established under authority of Title 10, U. S. Code, as amended.

A Captain in the Navy or a Colonel in the Marine Corps is assigned as the Professor of Naval Science. He is assisted by commissioned officers and others detailed from the Navy and Marine Corps.

The purpose of NROTC is to provide a steady supply of well-educated junior officers for the line and staff corps of the regular Navy and to build up a reserve of trained officers who will be ready to serve their country at a moment's notice in a national emergency. NROTC graduates are given equal rank, equal treatment, and equal opportunities with the graduates of the United States Naval Academy.

Types of NROTC Students

Students in the NROTC are of two types:

1. Students in the NROTC Navy-Marine Scholarship Program are appointed Midshipman, USNR. Such students assume an obligation to make all required summer practice cruises and upon acceptance of an appointment as a commissioned officer in the U. S. Navy or U. S. Marine Corps serve at the pleasure of the President. The Secretary of the Navy establishes criteria for voluntary termination of an officer's status to meet the needs of the naval service. At the present time the required minimum active duty service period of four years has been established by the Secretary of the Navy.

The NROTC Navy-Marine Scholarship Program briefly described above is one of the most remarkable educational opportunities ever offered. Public Law 729 (as amended by Public Law 88-647), signed by the President on 13 August 1946, instituted this program for the selection and training of officer candidates for the Navy and Marine Corps in colleges and universities throughout the country. The cost of tuition, fees, and textbooks will be paid by the Government. Necessary uniforms will be provided by the Government and students will receive subsistence pay for other expenses during college at the rate of \$100 per month for a maximum of four years. Active duty pay while on summer training is based on rate of pay for midshipmen of the Naval Academy (approximately \$247 per month at present).

Normally students will attend college for four years and may take any course of study leading to a baccalaureate degree; however, students who desire to enroll in the following courses will be considered on an individual case basis by the Commanding Officer of the NROTC Unit prior to appointment as a midshipman:

Agronomy	Entomology	Pre-medical
Animal Husbandry	General Agriculture	Pre-theological
Animal Science	Horticulture	Pre-veterinary Medicine
Art	Landscape Architecture	Real Estate
Dairy Husbandry	Law	Soil Conservation
Dairy Manufacturing	Medicine	Soils
Dairy Production	Music	Theology
Dentistry	Pharmacy	Veterinary Medicine
Dramatics	Pre-dental	Wildlife Management

In addition to the requirements of their major, NROTC students are required to complete 30 quarter hours of Naval Science. They must also complete certain Navy-specified university courses, most of which may be substituted for required or elective courses. Summer quarters are occupied with two at-sea training cruises and one summer period of aviation-amphibious indoctrination, lasting from six to eight weeks each. Upon graduation NROTC Scholarship students must accept a commission as Ensign, USN, or Second Lieutenant, USMC, if offered.

Entrance to the NROTC Navy-Marine Scholarship Program described above is effected through nation-wide competition. Applicants must make independent arrangements to take either the Scholastic Aptitude Test, offered by the College Entrance Examination Board, or the American College Test at their own expense. Application blanks and information bulletins are available each Fall at high schools, colleges, and Offices of Naval Officer Procurement. For more details, contact the Professor of Naval Science of this university.

As required by Title 10 U. S. Code 511, selected candidates must enlist in the U. S. Naval Reserve for six years in pay grade E-1 (Seaman Recruit) prior to being appointed Midshipman, USNR, and receiving compensation. Students disenrolled from the NROTC Program for reasons beyond their control shall be discharged from enlisted status. In addition, NROTC Scholarship students may resign from the Program without prejudice at any time prior to the beginning of their third year in the Program, and they will also be discharged from their enlisted status.

2. Students in the NROTC Navy-Marine College Program have the status of civilians who have entered into a mutual contract with the Navy. If the student successfully completes the requirements for a degree from Auburn University, plus Naval Science and certain Navy-specified university courses, he may become a commissioned officer in the Navy or Marine Corps Reserve. These students are not entitled to the compensation or benefits paid NROTC Scholarship students, except that they are entitled to a uniform issue, Naval Science textbooks, subsistence pay (\$100 monthly) during their final two years of NROTC training, and summer cruise compensation. If in all respects qualified, they are commissioned as reserve officers in the United States Navy or Marine Corps upon graduation from Auburn University. They are required to serve on active duty for a period of three years and retain their commission for a total of six years from date of appointment (three years active duty, two years ready reserves, and one year standby reserve), unless sooner released by the Secretary of the Navy. NROTC College Program students selected as Distinguished Naval Graduates will be offered a commission in the regular Navy. Students to be commissioned in the Marine Corps may apply for a commission as Regular Officers and, if accepted under current quotas, will have the same options of service as NROTC Scholarship students.

Students in the NROTC Navy-Marine College Program who have not yet qualified for entitlement to the \$100 per month subsistence payments may resign from the NROTC Program without prejudice.

Students in this Program are eligible and encouraged to apply for the NROTC Scholarship Program through national competition. In addition, each year the Professor of Naval Science nominates for consideration outstanding NROTC College Program students for appointment as NROTC Scholarship students, such appointment to become effective the following Fall Quarter.

While at Auburn University an NROTC Navy-Marine College Program student may take any curriculum which leads to a baccalaureate or higher degree. This does not, however, entitle the student to any delay of active duty requirements after attaining the basic requirements for a baccalaureate degree and commissioning. NROTC College Program students are required to complete the same Naval Science and Navy-specified university courses as NROTC Scholarship students. They must complete all Naval Science requirements prior to or concurrently with receipt of first baccalaureate degree. Summer training will consist of an at-sea training cruise between the junior and senior years. During this training period, NROTC College Program students will be paid at the same rate as NROTC Scholarship students. Receipt of subsistence pay of \$100 per month during the junior and senior years in the NROTC College Program is contingent upon fulfilling the following requirement:

Enlist in the U. S. Naval Reserve (inactive) for the standard six-year obligation. Those students already serving under a reserve enlistment contract will be discharged and reenlisted under provisions of Title 10 U. S. Code 511.

Junior and senior NROTC College Program students who are disenrolled from the Program for reasons beyond their control, or without willfully violating the terms of their contract, will be discharged from their reserve status at the same time, unless they request active duty or retention in the naval reserve.

NROTC College Program students are selected by the Professor of Naval Science.

General Qualifications for Enrollment

In general each candidate for enrollment in the NROTC must meet the following requirements:

1. Have attained his 17th birthday on or before July first of the year of enrollment and be of such age that he will not have attained his 25th birthday before July first of the year he will be commissioned. The Professor of Naval Science is authorized to waive the minimum age requirement for NROTC College Program students of the freshman class in those cases where he considers the student of sufficient maturity to undertake the Naval Science courses and drills.

2. Be morally qualified and possess officer qualifications and character as evidenced by appearance, scholarship, extracurricular activities, and record in his home community.

3. Be at least a high school graduate or person of equivalent educational level if selected competitively; or be enrolled in good standing or accepted for admission at an NROTC institution if selected by the Professor of Naval Science.

4. Be physically qualified in accordance with the current manual of the Navy Medical Department requirements for entrance into the NROTC Program.

Equipment

Uniforms, Naval Science textbooks, and equipment necessary to the NROTC Program will be furnished by the government to students of both NROTC Programs. The uniform will be worn only when students are engaged in drills, attending Naval Science labs, or during other naval activities prescribed by the Professor of Naval Science.

Selective Service Deferment

1. NROTC students are draft deferred under the Selective Service Extension Act of 1951 from the time of executing their oath of office or contract. This does not remove the legal requirement for all males to register with their local draft board upon reaching age 18.

2. NROTC students dropped from the program become eligible for the draft. Students in the NROTC Navy-Marine Scholarship Program and those enrolled in the last two years of the NROTC Navy-Marine College Program who are disenrolled from the NROTC Program for reasons beyond their control will be discharged from their enlisted status unless they request active duty or retention in the naval reserve.

3. The Department of Naval Science will keep the appropriate local draft board informed as to the status of each NROTC student.

Curriculum

The Naval Science curriculum consists of the following hours per week: Freshman, junior, and senior Naval Science courses consist of five hours per week; sophomore courses three hours per week; and Marine Corps Option courses four hours per week.

The Naval Science subjects carried during the four-year curriculum are listed below.

FIRST YEAR

- 1st Qtr. Orientation to the Navy and Marine Sciences (NS 111)
- 2nd Qtr. Naval Ships Systems (NS 112)
- 3rd Qtr. Highlights of Naval and Military History (NS 113)

SECOND YEAR

- 1st Qtr. Seminar: Sea Power and Maritime Affairs (NS 211)
- 2nd Qtr. Seminar: Sea Power and Maritime Affairs (NS 212)
- 3rd Qtr. Seminar: Sea Power and Maritime Affairs (NS 213)

(U. S. N. Candidates)

THIRD YEAR

- 1st Qtr. Navigation (NS 311)
- 2nd Qtr. Navigation (NS 312)
- 3rd Qtr. Naval Operations (NS 313)

FOURTH YEAR

- 1st Qtr. Naval Weapons Systems (NS 411)
- 2nd Qtr. Principles of Naval Organization and Management (NS 412)
- 3rd Qtr. Principles of Naval Organization and Management (NS 413)

(U. S. M. C. Candidates)

THIRD YEAR

- 1st Qtr. Evolution of the Art of War (NS 321)
- 2nd Qtr. Evolution of the Art of War (NS 322)
- 3rd Qtr. Evolution of the Art of War (NS 323)

FOURTH YEAR

- 1st Qtr. Amphibious Warfare (NS 421)
- 2nd Qtr. Amphibious Warfare (NS 422)
- 3rd Qtr. Amphibious Warfare (NS 423)

Each of the above subjects carry three quarter hours of credit with the exception of the sophomore courses which carry one quarter hour of credit and the Marine Corps option courses which carry two quarter hours of credit. These hours of credit will be considered as a part of the normal quarterly load required for NROTC students; however, Auburn University graduation requirements will be increased by 18 hours over the number of hours listed in the University catalog.

Navy-specified University Courses

Courses in the following subjects must be completed by all NROTC students prior to graduation: American Military History, Political Science, and Computer Science.

Students having a major field of study in Engineering, Physics, Chemistry, Mathematics, or Education with teaching majors in mathematics or physical science will complete the following courses in addition to the above:

Calculus, and Physics (or Chemistry)

Students having a major field of study in Arts, Humanities, Business, Political Science, Economics, and Education with teaching majors other than mathematics or physical science will complete the following courses:

Calculus (or Statistics), and

Physics (or Chemistry, Biology, Geology, or Zoology)

Flight and Ground Instruction

A program of flight and ground instruction is offered eligible NROTC students who have completed their sophomore year. The primary purpose of such instruction is to ascertain the student's aptitude for Naval Aviation, but it may also enable students to become eligible for a private pilot's license. Flight training under the program is at Government expense and is in addition to the presently prescribed Naval Science curriculum for NROTC students.

Naval Honor Graduates

The Professor of Naval Science may designate as a Naval Honor Graduate any candidate who possesses outstanding qualities of leadership, high moral character, a definite aptitude for the naval service, and who has distinguished himself in his chosen academic major.

In order to qualify for this designation, a candidate must achieve an academic standing in his major field equivalent to "graduation with honor" (grade point average of 2.4 or better) and must also achieve an equivalent standing in aptitude and Naval Science subjects.

Distinguished Naval Graduate Designation

In their senior year students enrolled in the NROTC College Program who meet the following requirements will be designated as a Distinguished Naval Graduate and tendered a regular Navy appointment:

1. Stand in the top 20 percent of the NROTC program OR stand in the top 10 percent in military aptitude and top 1/3 of the NROTC Program.
2. Be physically qualified for appointment in the regular Navy.

The top 15 percent of the total graduates of the NROTC College Program may be selected as Distinguished Naval Graduates. Selections will be made by a board convened by the Professor of Naval Science.

Department of Air Force Aerospace Studies (AFROTC)

COLONEL CLEMENTS B. MERRITT

Professor of Air Force Aerospace Studies and Commander

THE AIR FORCE ROTC was established at Auburn University in the fall of 1946 as the School of Air Science and Tactics. As a result of the ROTC Vitalization Act of 1964, the curriculum was revised and the institutional title changed to the School of Air Force Aerospace Studies. During the Fall Quarter, 1967, the title was re-designated Department of Air Force Aerospace Studies. The officer education program under the new legislation is a revitalized effort designed to provide education that will develop skills and attitudes vital to the professional Air Force Officer. It is designed to qualify for commission those college men and women who desire to serve in the United States Air Force.

Auburn students may receive an Air Force commission by successfully completing the requirements of either the AFROTC two year or four year program. The four year program contains the General Military Course, Field Training, and the Professional Officers Course. The two year program option consists of Field Training and the Professional Officers Course. A description of the courses, requirements for entry, etc., are listed below.

General Military Course (Basic Course)

The Air Force course of study offered during the student's freshman and sophomore academic years is the General Military Course (GMC). This is composed of one class hour and one Corps Training hour per week. The Corps Training extends beyond drill and ceremonies to include briefings by various Air Force Commands and agencies. Students enrolled in the GMC are provided the opportunity to visit various air bases to acquaint them more fully with the operational Air Force units. One credit hour is allowed for each quarter of the six quarter basic course successfully completed. Six quarters of the General Military Course is one requirement for admission to the Professional Officer Course.

Field Training

Normally, this is a student's first extended exposure to an operational Air Force environment. It is here that they receive junior officer training and leadership development in close contact with students from other schools and states. Field Training at active Air Force bases across the country is usually a high point in the pre-commissioning process.

Applicants for the professional officers course attend a summer Field Training Course between their sophomore and junior years. Students who have completed the GMC are assigned to a four-week training unit and those who did not have the opportunity to take the GMC are assigned to a more intensive six-week course. The Air Force furnishes uniforms, housing, medical care, and rations in addition to giving the cadets a round trip travel allowance and military pay. Applicants who successfully complete Field Training become eligible for the Professional Officer Course.

Professional Officer Course

(Advanced Course)

The Professional Officer Course is designed to provide highly qualified Junior Officers for the United States Air Force. Enrollment in the program is based upon such factors as scholarship, physical qualifications, leadership, desire for flying training, and academic major. Successful completion of the course qualifies the student for appointment as a Second Lieutenant in the United States Air Force Reserve.

The program consists of a six-quarter course normally taken during the junior and senior year. Enrollment in the advanced course is also open to graduate students if they have six-quarters of school remaining. Three classroom hours of instruction and one hour of Corps Training are taken per week. Three credit hours per quarter or a total of 18 credit hours are granted for completion of the Professional Officer Course; however, only six credit hours may be applied towards the total credits required for graduation. Students enrolled in the program are given a monthly subsistence allowance and those selected for the pilot category are eligible for the Flight Instruction Program.

Professional Officer Course Applicants Must:

1. Be a United States citizen.
2. Be physically qualified in accordance with Department of the Air Force standards.
3. Be under 30 years of age at the time of commissioning except that pilot and navigator applicants must not be older than 26½ years when commissioned.
4. Complete the GMC requirements, a field training course, or have equivalent credit in lieu thereof.
5. Pass the Air Force Officer Qualifying Test (AFOQT).
6. Have an academic average of 1.0 or better.
7. Have six-quarters of undergraduate or graduate school remaining.
8. Enlist in the Air Force Reserve for a period of six years or eight years for those in the college scholarship program.
9. Execute a written agreement to complete the Advanced Course and attend a summer training course.
10. Agree to accept a commission as a Second Lieutenant in the USAF Reserve and serve at least four years if not on flying status or six years if Pilot or Navigator qualified.
11. Be selected by the Professor of Air Force Aerospace Studies.

Veterans with previous honorable active U.S. military service who desire to enroll in the advanced course may receive a waiver for either the GMC or its equivalent as an entrance requirement. If he meets all other requirements he will be enrolled at the beginning of his junior year.

College Scholarship Program

Scholarships are available to qualified men and women. This financial assistance will cover full tuition, laboratory expenses and incidental fees plus

providing a book allowance, a monthly stipend and all uniform items. These scholarships are awarded to qualified college sophomores and juniors following application to the Professor of Air Force Aerospace Studies and selection by local AFROTC and central selection boards. Four year scholarships may also be awarded to qualified High School seniors who apply to AFROTC, are recommended by a selection board and are accepted by an institution hosting a four year program.

Flight Instruction Program

The Flight Instruction Program is conducted during the cadet's last year in AFROTC and provides the pilot category cadets with 36½ hours of flight training and 40 hours of Air Force conducted ground school. The primary purpose of this training is to determine a cadet's aptitude for flying and to motivate him toward a career as an Air Force pilot. The course is designed to meet minimum Federal Aviation Administration (FAA) flight and ground school requirements for a FAA private pilot license. The Flight Training, provided by Auburn University at no expense to the student, is conducted under a contract with the Air Force, and is monitored by the FAA.

Uniforms and Equipment

All students enrolled in the AFROTC program must deposit \$30.00 with the University Bursar. One dollar and fifty cents per quarter is then withheld by the University Bursar to cover the cost of cleaning and repair of the uniforms and, when applicable, to support AFROTC activities. After payment of the deposit, students are issued a uniform and other necessary uniform items through the AFROTC Supply Office under the uniform commutation system. Texts and other items required for AFROTC academics are also issued through the AFROTC Supply Office. Upon completion of the GMC, or upon a student's withdrawal, the uniform and all other supplies are turned in and the deposit is then returned to the student. Most of the uniform items issued to POC members become the property of the member when he is commissioned.

Distinguished AFROTC Graduates

The Professor of Air Force Aerospace Studies may designate as a Distinguished AFROTC Graduate a POC member who:

1. Has a superior academic record and high AFOQT score.
2. Possesses outstanding qualities of leadership and high moral character.
3. Demonstrates leadership ability through achievements in recognized campus activities, both curricular and extracurricular, which in conjunction with (1) and (2) above, warrants designation as "DISTINGUISHED."

Selective Service Deferrals

Scholarship students and those enrolled in the Professional Officers Course are deferred. Other students voluntarily participating in the General Military Course may request the Professor of Aerospace Studies to select them for deferment provided they meet certain qualifications. This deferment will continue as long as the student is enrolled in the AFROTC and otherwise remains qualified.

Description of Courses

This section contains all courses in the University, listed by departments, arranged in alphabetical order.

Those courses bearing the numbers 100 to 199, inclusive, are normally offered for freshmen; those from 200 to 299, sophomores; 300 to 399, juniors; 400 to 499, seniors; 500 to 599, fifth year students; 600 to 799, graduate students.

Description of courses in each department includes: (a) course number; (b) descriptive title; (c) in parentheses, credit in quarter hours, i.e. one quarter (5), two quarters (5-5), etc.; (d) lecture and laboratory hours for courses with laboratory (where no statement is made the course consists of lecture periods equal in number to course credit); (e) the quarter in which the course is offered; (f) prerequisite (Pr.); (g) description of subject matter and method.

Preceding the description of courses for each department is a list of the departmental faculty.

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University Courses (U)

The following courses, interdisciplinary and experimental in character, are designed to enable the student to see in a wide perspective the relationship of individual courses in his curriculum and to understand more fully the dominant ideas and concepts confronting him in the modern world. University Courses are open to students in all curricula.

200. **Frontiers of Behavior (3). Pr., sophomore standing.**
Analyses of current behavioral topics with special emphasis upon social issues important to college age students.
275. **Interpersonal Relations (3).**
A multi-disciplinary study of methods used by human beings in their interactions that tend to be mutually rewarding. Emphasis is on practical applications within the context of the student's present fields of study and projected fields of work.
301. **The meaning of Environmental Quality (3). Pr., junior standing or consent of instructor.**
Faculty discussion leaders representing engineering, agriculture, humanities, social and biological sciences, art and architecture, planning, etc., will present materials from their professional disciplinary perspectives. Discussions will aid student understanding of the problem, potential solutions and their implications for mankind.
305. **The Model United Nations (1). Pr., sophomore standing. S-U only.**
Preparation of materials for, and active participation in, the sessions of the Model United Nations program held annually on the campus.
310. **Our Man-Made World (5). Pr., junior standing or consent of instructor.**
How the techniques and theories of modern technology attempt to deal with the problems of our society and environment.
400. **Psychological Study of the Community (3). Lec. 2, Lab. 2. Pr., junior standing and permission of instructor.**
Local community programs designed to foster interest in and an understanding of our society. A number of community leaders will be used as speakers and discussion leaders.
401. **Introduction to Planning (3). Pr., junior standing and permission of instructor.**
A critical examination of the processes by which cities and regions are planned and developed, with emphasis placed on urban areas, and of the influences of technical and social change. Credit not allowed toward graduate work in urban and regional planning.
422. **Natural Philosophy (3). Pr., junior standing.**
A synthesis of modern thought concerning the unifying ideas of physical and biological sciences and their impact on the social-economic structure of man-made society. Contributions from various sciences are evaluated in light of knowledge of the last part of the twentieth century.

Accounting and Finance (ACF)

Professors Robinson, *Head*, Hartman, and Hill
Associate Professors Criss, Gritz, Hale, Stalnaker, and Miley
Assistant Professors Beard, Bice, Davis, and Williams
Instructors Becker, Dinius, Whatley, and Dalton

Accounting

211. **Principles of Accounting I (5). Lec. 3, Lab. 4. Pr., sophomore standing.**
Basic accounting principles, including the accounting cycle and preparation of financial statements. ACF 211 is not open to students with credit in ACF 215.
212. **Principles of Accounting II (5). Lec. 3, Lab. 4. Pr., ACF 211.**
A continuation of accounting principles with emphasis on their application to partnerships, corporations, and preparation and analysis of various financial statements.
215. **Fundamentals of General and Cost Accounting (5). Lec. 3, Lab. 4. Pr., sophomore standing.**
The fundamental concepts and principles of general and cost accounting with emphasis on accumulating, reporting, and interpreting cost data in the production area of business operations. (Not open to undergraduates majoring in BA. Credit in ACF 211 excludes credit for ACF 215.)
310. **Managerial Cost and Budgeting (5). Lec. 3, Lab. 4. Pr., ACF 212.**
The third course for accounting majors or a terminal course for non-accounting majors. Introductory cost accounting and budgeting with some emphasis on distribution costs and managerial accounting problems. ACF 310 and 311 may be taken independently or concurrently; both are prerequisites for ACF 312.

- 311. Intermediate Accounting I (5). Lec. 3, Lab. 4. Pr., ACF 212.**
A comprehensive study of accounting principles and theory, including a review of the accounting cycle and accounting for current assets, current liabilities, and investments. ACF 310 and 311 may be taken independently or concurrently; both are prerequisites for ACF 312.
- 312. Intermediate Accounting II (5). Lec. 3, Lab. 4. Pr., ACF 310 and 311.**
A continuation of accounting principles and theory with emphasis on accounting for fixed assets, intangibles, long term liabilities, corporate capital structure, and analysis of financial statements.
- 314. Income Tax Accounting (5). Pr., ACF 212.**
Interpretation of the regulations, preparation of returns, and the keeping of accounting records for tax purposes will be considered in this course.
- 410. Cost Accounting (5). Lec. 2, Lab. 6. Pr., ACF 312, and junior standing.**
Accounting principles and procedures involved in job-lot, process, and standard cost accounting.
- 414. Advanced Income Tax Accounting (5). Pr., ACF 312, 314, and junior standing.**
Special tax accounting problems of individuals, partnerships, corporations, estates, and trusts. Extensive use will be made of a tax service program.
- 415. Business Information and Accounting Systems (5). Pr., ACF 312 and senior standing.**
The design, installation, operation, and interrelationship of accounting systems which constitute the information flows and provide the basis for financial decisions in modern organizations.
- 416. Auditing (5). Pr., ACF 312 and senior standing.**
The principles of auditing with particular attention to methods of testing, analyzing, and summarizing accounting records.
- 417. Advanced Accounting (5). Lec. 2, Lab. 6. Pr., ACF 312 and junior standing.**
Specialized accounting problems, including partnerships, joint ventures, installment sales, consignments, receiverships, and estates and trusts.
- 418. Accounting for Business Combinations (5). Lec. 2, Lab. 6. Pr., ACF 312 and junior standing.**
Accounting for home and branch office procedures, business combinations, parent and subsidiary operations, and preparation of consolidated statements.
- 419. Governmental Accounting (5). Pr., ACF 312 and junior standing.**
Budgeting and accounting procedures of governmental divisions.
- 490. Special Problems. (1-10). Pr., ACF 312 and senior standing.**
An opportunity for qualified students to conduct individual research and study of an advanced nature in the fields of accounting and finance under the guidance of a faculty member.

GRADUATE COURSES

- 610. Managerial Accounting (5). Pr., ACF 212 and graduate standing or consent of instructor.**
Primarily non-technical, for the student who will be confronted with business problems requiring a comprehensive understanding of accounting concepts, and the accepted methods of applying these concepts in decision-making, planning, and control.
- 611. Advanced Accounting Theory (5). Pr., ACF 312 and graduate standing or consent of instructor.**
A review of the origin and development of double-entry accounting; followed by a critical study of the theory of modern accounting principles and procedures.
- 614. Financial Information Systems (5). Pr., graduate standing and consent of instructor.**
Identification, evaluation, and modification of critical information flows into efficient and effective information systems to service modern management decision needs.
- 616. Advanced Auditing (5). Pr., ACF 416 and graduate standing or consent of instructor.**
Application of auditing principles and procedures to practical problems encountered in the field of public and private accounting.
- 617. Advanced Accounting Problems (5). Pr., ACF 417 and graduate standing or consent of instructor.**
An extension to and a consolidation of all the other advanced accounting courses. Preparation for special accounting examination.
- 650. Seminar (1-10). Pr., Graduate standing or consent of instructor.**
For those students engaged in intensive study and analysis of accounting and finance problems.
- 690. Special Problems (1-15).**
Variable content in the accounting and finance areas.
- 699. Research and Thesis. Credit to be arranged.**

Finance

320. **Risk and Insurance (5). Pr., EC 200 and junior standing.**
Essentials of risk management, with the emphasis on the use of insurance in meeting these risks; including the characteristics of property, liability, life and health insurance.
321. **Property Insurance (5). Pr., EC 200 and junior standing.**
The principles, uses and types of insurance with particular emphasis on fire, marine, automobile, and casualty lines.
322. **Life Insurance (5). Pr., EC 200 and junior standing.**
The organization of the life insurance business and the various types of contracts.
323. **Real Estate (5). Pr., EC 200 and junior standing.**
The fundamental principles and practices as applied to the purchase, sale, lease, mortgage, title, and management of real estate.
340. **Personal Finance (3). General elective. Pr., junior standing.**
Plans for managing personal financial problems involving insurance, housing, household budgeting, investments, personal and bank loans, credit and time buying, etc.
361. **Principles of Business Finance (5). Pr., EC 202 and ACF 212.**
The first course in Business Finance with emphasis on short-term, intermediate and long-term financing of business firms.
363. **Advanced Business Finance (5). Pr., ACF 361.**
A continuation of ACF 361 with emphasis on capital budgeting, cost of capital, growth, promotion, and reorganization.
367. **Money Markets and Financial Institutions (5). Pr., ACF 212, EC 202 and junior standing.**
A study of the structure and operation of commercial banks and other financial institutions and their role in the financing of business.
464. **Investments (5). Pr., ACF 361, junior standing.**
Individual investment policies, investment institutions, and types of investments available.
466. **Security Analysis (5). Pr., ACF 464 and junior standing.**
An advanced study of the techniques and principles of critical analysis and interpretation of corporate reports. Analysis of earnings, growth, timing and portfolio management. Funds and institutional policies are critically examined.
467. **Cases and Problems in Business Finance (5). Pr., ACF 363 and junior standing.**
A course emphasizing decision making and problem solving within the financial framework. The effect of financial decisions upon the total firm from a short and long range point of view.
490. **Special Problems. (1-10). Pr., ACF 312 and senior standing.**
An opportunity for qualified students to conduct individual research and study of an advanced nature in the fields of accounting and finance under the guidance of a faculty member.

GRADUATE COURSES

650. **Seminar (1-10). Pr., Graduate standing or consent of instructor.**
For those students engaged in intensive study and analysis of accounting and finance problems.
663. **Advanced Corporation Finance (5). Pr., ACF 361.**
Intensive study of theory and problems of business finance from a decision making, internal, problem-solving point of view.
690. **Special Problems (1-15).**
Variable content in the accounting and finance areas.

Administration and Supervision (AED)

Professors Pierce and Tincher

Associate Professors Walden, Head, Martin, Moore, and Morgan

Assistant Professors Clark, Cleveland, Clowes, Hayes, Scebra, Watkins, and Williams

Prerequisites and corequisites in the Department of Administration and Supervision are experience in teaching or appropriate fields, and employment or definite professional objectives leading to employment in administration or supervision.

618. **Organization and Administration of Higher Education (5). Pr., IED 663 or IED 665.**
For educational leaders in higher education. The organization, administration, and evaluation of institutions in higher education in terms of the academic program, student personnel services, business affairs, and related programs including relations between higher education and the state and federal government.

- 645. Current Problems and Issues in Educational Administration (5).**
The problems, issues, and trends affecting educational institutions with particular attention to development of administrative procedures to cope with the extensive changes occurring in education.
- 646. Studies in Education (1-3). Pr.** one quarter of graduate study may be repeated for credit not to exceed 3 hours.
A special problem in administration, supervision, guidance, or higher education using research techniques. (Credit in ED 651 prior to 1960 excludes credit for this course.)
- 650. Seminar in Area of Specialization (1-10).**
Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
- 651. Internship in Area of Specilization (1-15). Pr., consent of major professor.** May be repeated for credit not to exceed 15 hours.
Provides advanced graduate students with full-time, supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences are accompanied by regularly scheduled, on-campus discussion periods, designed to provide positive evaluation and analysis of the field experience.
- 659. Practicum in Area of Specialization. (Credit to be arranged.) No more than 10 hours of practicum credit may be earned at Master's Level. Pr., permission of major professor.**
Provides advanced graduate students with supervised experiences with emphasis on the application of concepts, principles, and skills acquired in previous course work.
- 670. Fundamentals of Supervision (5).**
The supervisory process including such topics as the theoretical framework in which supervision takes place; the purpose, functions and processes of supervision; supervisory tasks and skills; and the methods of evaluating supervision.
- 681. Organization and Administration of Public Education (5).**
For superintendents, principals, teachers and other educational leaders. Topics include purposes of organization and administration; organization and administration on federal, state, and local levels; financial support and accounting; operation of plant; school-community interaction, and personnel administration.
- 683. The Leadership Role in Educational Administration (5).**
Current theories, concepts and principles of leadership and their application to education. Further emphasis placed on the responsibility of the educational administrator for leadership in the school and community, in the continuous improvement of staff competence and principles, and in evaluation of effective leadership.
- 685. Administrative Organization and Behavior (5).**
Current theories and concepts of formal organization and of collective behavior. Includes a social-psychological approach to organizations, and treats current trends in organizing for instruction.
- 686. Administration and Policy Formation (5).**
Analysis of basic social forces, antecedent movements, and political action leading to formal enactment of educational policy at national, state, and local levels. Consideration is given to the roles and functions of governing and regulating boards and agencies.
- 688. School Finance and Business Administration (5).**
Relationships between educational finance, educational program, tax structures, foundation programs and internal accounting. Theories of public finance and economic principles relating to financial support of educational systems at the local, state and federal levels.
- 689. Educational Plant Maintenance (5).**
Relationship of educational plant maintenance and operation to educational program; procedures in educational plant maintenance and operation; safety factors; trends in modernization and new plant planning.
- 690. Educational Business Management (5).**
Procedures and practices in educational finance at the business or operational level. Attention to budgeting, accounting, purchasing, transportation, cost analysis, and management of human and material resources.
- 691. Educational Plant Planning (5).**
Development of educational plants; relationships between curriculum and plant; trends in plant design; analysis of physical conditions, relationships of professional and lay personnel in educational plant planning.
- 692. Constitutional, Statutory and Judicial Foundations of Education (5).**
The constitutional and statutory provisions for education and an analysis of judicial decisions affecting education. Among topics are authority and responsibility of the teacher; rights, privileges and responsibilities of students; use of school property, taxation; curriculum, contracts and retirement provisions; contractual capacity and liability and transportation.
- 693. Personnel Administration (5).**
Assists educational leaders with effective personnel administration and the quality of education. Research results and experimentation in morale, welfare, work loads, pupil accounting, and bases for salary determination as they relate to staff and pupil personnel.
- 694. Studies for Comprehensive Educational Planning (5).**
Principles and procedures for collecting, analyzing, and utilizing data in the process of educational planning, including such topics as: community characteristics, including power structure; economic bases and population; system characteristics, including administrative organization, finance, personnel, physical facilities; and instructional program.

697. **Student Personnel Work in Higher Education (5).** Pr., CED 621.
Theories, principles, practices, organization, administration, and evaluation of student personnel services in higher education.
699. **Research and Thesis (Credit to be arranged).** May be taken more than one quarter.
798. **Field Project (Credit to be arranged.)** May be taken more than one quarter.
799. **Research and Dissertation (Credit to be arranged.)** May be taken more than one quarter.

Aerospace Engineering (AE)

Professors Pitts, Head, Harwell, Martin, and Storzini
Associate Professors Cutchins, Nichols, and Sherling
Assistant Professor Cochran

203. **Aerospace Fundamentals (3).** Lec. 2, Lab. 3. Pr., TS 106.
Aerospace concepts and terminology. General schemes and designs of aerospace systems and applications of computers to same. Duplicate credit will not be given for AE 203 and IE 204 or similar courses which include FORTRAN programming instruction.
300. **Aerospace Analysis I (3).** Pr., MH 265.
Special methods and notations used in Aerospace Engineering.
302. **Airloads (4).** Lec. 3, Lab. 3. Pr., ME 340.
Application of the basic equations of fluid dynamics to the prediction of pressure distribution, wing loading and hinge moments. Propeller design and selection.
303. **Theoretical Aerodynamics I (3).** Pr., ME 340 and AE 300.
Fundamental analysis of aerodynamics, potential flow theory. Correlation of potential flow theory with experimental results.
304. **Theoretical Aerodynamics II (4).** Lec. 3, Lab. 3. Pr., AE 303.
Fundamental principles of compressible flow including subsonic, transonic, supersonic, and hypersonic aerodynamics. High speed wind tunnels and laboratory techniques.
305. **Flight Performance (2).** Pr., AE 302.
Equations of motion and solution techniques for vehicle performance analysis including effects of propulsion system and aerodynamic variations.
307. **Aerospace Structures I (5).** Lec. 4, Lab. 3. Pr., ME 207.
Basic structural analysis. Shear and bending in monocoque structures. Deflections of beams and frames. Column and plate buckling. The laboratory portion is devoted to experimental techniques in stress analysis.
310. **Aerospace Analysis II (4).** Pr., AE 300, ME 321.
Linear and non-linear systems, linearization procedures, and linear systems analysis techniques. Transfer functions and stability criteria for some aerospace systems and components. Other special techniques as required by advanced courses.
311. **Aerospace Materials and Methods of Construction (2).** Pr., ME 202 and junior standing.
Nomenclature, coding systems, physical and structural properties, applications and fabrication techniques as applied to aerospace materials.
326. **Fundamentals of Aerospace Dynamics (3).** Pr., AE 302, AE 307, AE 310 and junior standing.
Dynamics of aerospace vehicles in moving reference frames; Eulerian formulation for the vehicle as a rigid body; Lagrangian formulation and small oscillation theory. Provides a unified basis for further studies in aircraft vibration, flight dynamics, and space flight mechanics.
400. **Viscous Aerodynamics (4).** Lec. 3, Lab. 3. Pr., AE 304 and junior standing.
Theoretical background essential to a fundamental understanding of laminar and turbulent boundary layers and their relations to skin friction and heat transfer. Experimental techniques.
401. **Aeronautical Problems I (1).** Lab. 3. Pr., senior standing.
Investigation of current aeronautical problems; preparation and presentation of technical papers and reports.
402. **Aeronautical Problems II (1).** Lab. 3. Pr., AE 401.
Continuation of AE 401.
409. **Aerospace Structures II (5).** Lec. 4, Lab. 3. Pr., AE 203 or IE 204 or equivalent knowledge of FORTRAN programming, AE 307, AE 310.
A continuation of AE 307. An introduction to the finite element method. The laboratory portion is devoted to the solution of structural problems on the digital computer.
414. **Equilibrium Gas Dynamics (3).** Pr., permission of instructor and junior standing.
Basic concepts of The Equilibrium Kinetic Theory and the equilibrium real gas properties. Aero-thermodynamic fundamentals of external flows for various atmospheric flight conditions in terms of flight speeds, altitudes and vehicle geometry.

- 415. Jet Propulsion (5). Pr., junior standing, coreq., AE 304.**
Internal aerodynamics and thermodynamics of rockets and air-breathing jet engines. Jet nozzles. Detailed analysis of flow through turbojet compressors, combustors and turbines.
- 416. Rocket Propulsion I (3). Pr., AE 415 and junior standing.**
Detailed analysis of the thermodynamics, aerodynamics, and design of liquid propulsion rockets.
- 417. Rocket Propulsion II (3). Pr., AE 415 and junior standing.**
Design and performance analysis of solid propellant rocket motors with emphasis on internal ballistics.
- 420. Dynamic Simulation (3). Pr., junior standing and AE 326.**
Computer techniques applied to the analysis of aerospace engineering problems using analog and hybrid computers and the digital problem-oriented language, Continuous System Modeling Program (CSMP).
- 421. Flight Vehicle Stress Analysis (3). Pr., junior standing and AE 409.**
Stress analysis of pressure chambers and vessels encountered in aerospace applications.
- 424. Nonequilibrium Gas Dynamics (3). Pr., permission of instructor and junior standing.**
Nonequilibrium Kinetic Theory of real atmospheric gases. Applications of the thermal and chemical nonequilibrium conditions to the external flows for various flight conditions.
- 427. Engineering Meteorology (3). Lec. 3. Pr., senior standing.**
Atmospheric heat balance, temperature distributions statics, thermodynamics, stability-instability, measurements. The physics of precipitation, use of adiabatic charts, the winds, elementary forecasting. Applications of meteorological studies in hydrologic and air quality engineering.
- 428. Space Propulsion Systems (5). Pr., junior standing and AE 415.**
Introduction to reaction engines for use in outer space vehicles. Environment of outer space, power requirements for space missions, introduction to relativistic mechanics, nuclear power systems, particle generators, magnetohydrodynamics, plasma accelerators and photonic engines.
- 429. Aircraft Vibration and Flutter (3). Pr., AE 326, AE 409 and junior standing.**
Free, forced, and damped vibration of single and multiple degree-of-freedom systems; introduction to vibration of continuous systems; introduction to flutter theory; applications in aerospace.
- 432. Astrodynamics I (3). Pr., AE 326 or permission of instructor, junior standing.**
Geometry of the solar system, detailed analysis of two-body dynamics and introduction to artificial satellite orbits; Hohmann transfer and patched conics for lunar and interplanetary trajectories. Elements of orbit determination.
- 433. Astrodynamics II (3). Pr., AE 432 and junior standing.**
Elements of special and general perturbation theory; n-body formulation and introduction to 3-body problem; introduction to powered flight analysis and space flight guidance.
- 434. Aerospace Systems Analysis (3). Pr., AE 429 or AE 441 or AE 432 and junior standing.**
Modeling of system elements, analysis of systems undergoing various motions connected with flight, and techniques of optimization of the system.
- 435. Elements of V/STOL Flight (3). Pr., AE 303 or permission of instructor, junior standing.**
The analysis of methods for generating high lift at low vehicle forward speeds.
- 436. Rotary Wing Aerodynamics (3). Pr., AE 304, AE 305, and junior standing.**
Aerodynamics and flight characteristics of the rotary wing aircraft.
- 439. Static Stability and Control (3). Lec. 2, Lab. 3. Pr., AE 304.**
Introduction to static stability and control of flight vehicles including laboratory techniques for determination of stability parameters.
- 441. Dynamic Stability and Control (3). Pr., AE 326, AE 439 and junior standing.**
Longitudinal and lateral dynamics of aircraft. Response to actuation of controls. Attitude dynamics of spacecraft. Emphasis on design considerations of various vehicles.
- 442. Automatic Stability and Control (3). Pr., AE 441 and junior standing.**
Introduction to principles and techniques of automatic control of aircraft and missiles. Effects on design variables.
- 445. Missile Aerodynamics (3). Pr., AE 400, AE 439 and junior standing.**
The aerodynamics of slender wing-body configurations for the low supersonic, moderate hypersonic and Newtonian continuum flow regimes. Linear and non-linear effects are considered as well as interference effects. Application to missile performance and stability for certain flight profiles.
- 448. Aerospace Design I (1). Lab. 3. Pr., AE 304, AE 409.**
An application of the design process oriented toward the aerospace field with emphasis on the development of creative thinking and team effort. A two quarter sequence with AE 449.
- 449. Aerospace Design II (1). Lab. 3. Pr., AE 448.**
A continuation of AE 448.

491. Special Problems (1-5 credit hours to be arranged). Pr., departmental approval. Not open to graduate students.

GRADUATE COURSES

601. **Advanced Supersonic Aerodynamics (5). Pr., AE 400.**
A rigorous development of linearized and nonlinear fluid flow theories and application. Lifting surfaces, lifting bodies, duct flow, boundary layer effects, shock and expansion waves, and method of characteristics are considered.
602. **Advanced Elements of High Speed Aerodynamics (5). Pr., AE 601 or equivalent.**
A continuation of AE 601 to include three-dimensional wing theory; slender body theory and similarity laws for subsonic, supersonic and hypersonic flow conditions.
603. **High-Speed Viscous Aerodynamics (5). Pr., AE 602 or equivalent.**
A continuation of AE 602 to include effects of conductivity and viscosity on aerodynamic properties.
605. **Aeroelasticity (3-5 hours credit to be arranged). Pr., AE 429. May be taken more than one quarter, not to exceed 10 hours.**
General formulation of aeroelastic problems, buffeting, flutter and loss of control, dynamic stresses.
608. **Aerospace Structural Dynamics (3-5 hours credit to be arranged). Pr., AE 429.**
Advanced theory of matrix structural analysis with applications to dynamics of flight.
609. **Advanced Aero-Structures (3). Pr., AE 429.**
Vibrations of solids and wave propagation, introduction to general methodology and thermodynamics of solids, derivation of large-deflection equations, principles of basic solids investigations, and application to aerospace structures.
610. **Advanced Vibrations Phenomena (3-5 hours credit to be arranged). Pr., AE 429.**
Aerospace applications of dynamic phenomena measurement including linear varying differential transformers, piezoelectric accelerometers, dynamic force gages, and strain gages. On line use of hybrid and digital computers for data analysis and combined experimental simulation involving both experiment and computer. Use of various types of shakers in dynamic tests.
611. **Thrust Generation (5). Pr., AE 415.**
Aerothermodynamics of compressible flow, chemical propellant characteristics, heat transfer in fluid flow, nuclear propulsion.
612. **Aerothermochemistry of Propulsion (3-5 credit hours to be arranged). Pr., AE 611 or permission of instructor.**
Selected topics emphasizing interrelation between internal aerodynamics and combustion phenomena in air-breathing jet engines and rockets. Various techniques of establishing equilibrium composition and flame temperatures; comparison of frozen and equilibrium flow in nozzles; effects of condensed phases; supersonic combustion.
613. **Advanced Air-Breathing Propulsion (3-5 credit hours to be arranged). Pr., AE 611 or permission of instructor.**
Selected topics emphasizing interaction between external aerodynamics and performance of air-breathing jet engines, boundary layer effects in diffusers and compressors, and detailed analysis of various techniques of minimizing detrimental effects, compressor and turbine matching in turbojets, cascade aerodynamics, and variable area jet nozzles.
615. **Hypersonic Flow Theory (3-5 hours credit to be arranged). Pr., AE 400, Coreq., MH 461. May be taken more than one quarter, not to exceed 15 hours.**
Hypersonic continuum theory, governing equations of motion for two and three dimensional flows, hypersonic small disturbance theory, viscous effects. Real gas effects in gas dynamics and rarefied gas flows, basic heat transfer concepts.
616. **Real Gas Dynamics (3-5 hours credit to be arranged). Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.**
A microscopic approach to the study of gas dynamics based on quantum mechanical models and statistical techniques.
617. **Molecular Theory of Aerodynamics (3-5 hours credit to be arranged). Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Free molecular, near-free-molecular, and transition flows of neutral gases are considered. Basic equations are developed and selected geometries are treated in detail.
619. **Dynamics of Flight (5). Pr., AE 441 or permission of instructor.**
Small-disturbance theory and the linearized solutions of the general equations of unsteady motions, aerodynamic derivative, derivatives analysis, aerodynamic transfer functions, dynamic stability of uncontrolled longitudinal and lateral motions, solutions of the dynamic stability problems by electronic computing devices, inverse problem, automatic stability and control.
620. **Flight Dynamics of Hypervelocity Vehicles (3-5 hours credit to be arranged). Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.**

Flight dynamics of steady and unsteady flight at hypersonic speeds, great-circle and minor-circle flight, re-entry, stability derivatives in hypersonic flow. Linearization of equations is investigated; static stability problems of hypervelocity vehicles are discussed.

632. **Advanced Astrodynamics (3-5 credit hours to be arranged). Pr., AE 433 or permission of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Selected topics from indirect and direct methods of trajectory optimization, trajectory isolation techniques, special and general perturbation theory, oblate earth problem, three body problem, mission analysis methods, and new research developments.
635. **Ion and Plasma Propulsion (5). Pr., permission of instructor.**
Basic physical and gas dynamic processes underlying methods for electrical acceleration of ionized gas flows appropriate to electrothermal propulsion, electrostatic propulsion, electromagnetic propulsion.
639. **Particle Kinetics of Plasmas (3-5 hours credit to be arranged). Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Gaseous plasmas based on the theory of individual particle kinetics. Emphasis will be placed on the development of basic concepts with sufficient generality to allow treatment of non-equilibrium problems of interest in aerospace research.
640. **Magneto-Gas Dynamics (5). Pr., permission of instructor.**
Review of electrodynamics, Maxwell stresses, field and momentum-energy tensors. Thermodynamics of fluids in electromagnetic fields. Equations of motion of a conducting gas. Discussion of typical flow problems. Consideration of microscopic aspects of plasma flows.
645. **Shock Tube Theory and Techniques (5). Pr., permission of instructor.**
Shock wave theory in real and perfect gases, expansion wave theory, reflected shock wave theory. Basic shock tube equations; effects of area change, driver types and characteristics. Non-ideal behavior in shock tubes, diaphragm opening effects, boundary layer effects, shock wave attenuation. Testing time derivation. Shock tube techniques and measurements.
646. **Plasma Diagnostics (3-5 hours credit to be arranged). Pr., permission of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Theoretical and applied studies of techniques for the measurement of plasma properties. The application of these techniques to aerospace research and testing.
690. **Seminar. Credit to be arranged. May be taken more than one quarter.**
Provides weekly lectures on current developments in aerospace sciences by staff members, graduate students, and visiting scientists and engineers.
691. **Directed Reading in Aerospace Engineering. (Credit to be arranged, not exceeding 5 hours.) May be taken more than one quarter.**
699. **Research and Thesis. (Credit to be arranged.) May be taken more than one quarter.**
799. **Research and Dissertation. (Credit to be arranged.) May be taken more than one quarter.**

Aerospace Studies (AF)

101. **General Military Course (1). Lec. 1, Lab. 1.**
The doctrine, organization and mission of the United States Air Force and introduction to strategic offensive forces.
102. **General Military Course (1). Lec. 1, Lab. 1.**
U.S. strategic offensive forces continued, the U.S. strategic defensive forces and an introduction to general purpose forces.
103. **General Military Course (1). Lec. 1, Lab. 1.**
A continuation of U.S. general purpose forces to include their organization and mission and an examination of Aerospace support forces.
201. **Contemporary Military Forces (1). Lec. 1, Lab. 1.**
An inquiry into national defense and security, the use of military instruments in national power, and the nature and principles of war.
202. **Contemporary Military Forces (1). Lec. 1, Lab. 1.**
Foreign military alliances with emphasis on the military policies, strategies and capabilities of the Communist Nations.
203. **Contemporary Military Forces (1). Lec. 1, Lab. 1.**
Collective security, U.S. alliances commitments, and the elements and processes of making defense policy.
301. **Growth and Development of Aerospace Power (3). Lec. 3, Lab. 1.**
Communicative techniques utilized by students in the POC and the development of airpower from the beginning of manned flight to 1961.
302. **Growth and Development of Aerospace Power (3). Lec. 3, Lab. 1.**
Concepts, doctrine and employment of aerospace forces from late 1950's to the present and an introduction to officer career development.

303. **Astronautics and Space Operations (3). Lec. 3, Lab. 1.**
The background and importance of space programs, vehicle system and space operations.
401. **Military Leadership (3). Lec. 3, Lab. 1.**
The need for leadership, the variables affecting the military leaders and an examination of professionalism.
402. **Military Management (3). Lec. 3, Lab. 1.**
Management in the Air Force and the use of planning, organizing, coordinating, directing, and controlling in the military service.
403. **Military Justice and Pre-Commissioning (3). Lec. 3, Lab. 1.**
An examination of the uniform code of military justice and its effects on discipline, and pre-commissioning.

Agricultural Economics and Rural Sociology (AS) (RSY)

Professors Yeager, Head, Bell, Blackstone, Danner, White, and Wilson

Associate Professors Dunkelberger and Stallings

Assistant Professors Clonts, Curtis, McCoy, and Vanlandingham

Instructor Driscoll

Agricultural Economics (AS)

202. **Agricultural Economics I (5). All quarters.**
Economic principles with emphasis on farm-related production, marketing, prices, consumption, taxation, credit, finance, public policies and tenure. Treats utilization of land, labor, and capital.
301. **Agricultural Marketing (5). Pr., AS 202 or EC 200.**
Principles and problems in marketing farm products. Analysis of marketing functions, services, and costs; reducing costs and improving marketing efficiency. Marketing methods and distribution channels of major farm commodities. Market institutions and operation.
302. **Farm Records and Tax Management (5). Pr., AS 202 or EC 200.**
Types and uses of farm records and accounts with emphasis on analyzing records to improve net farm income. Interpretation of income tax regulations and preparation of farm tax returns with emphasis on tax management.
303. **Agricultural Cooperatives (3). Pr., AS 202.**
Principles and problems of organizing and operating farmers' cooperative buying and selling associations.
304. **Agricultural Finance (3). Pr., AS 202.**
Economic problems and policies in financing agriculture.
305. **Farm Appraisal (3). Pr., AS 202.**
The theory of land values; techniques on farm land and building appraisals for different purposes; relationships of land use, soils, crops, forestry management, buildings, land titles, farm prices, taxes, and interest rates to land values; actual appraisals of selected farms; evaluation of appraisal methods and forms currently in use.
306. **Agricultural Economics II (5). Pr., AS 202 or equivalent.**
A continuation of economic principles with emphasis toward micro-economic concepts relating to farm firm.
401. **Farm Management (5). Pr., AS 202 or EC 200 and junior standing.**
Principles and problems in acquiring, organizing, and operating a successful farm business. Formation and integration of family and farm business goals.
403. **Agricultural Prices (3). Pr., AS 202 or EC 200 and junior standing.**
Principles and factors in the pricing process with special reference to agricultural products and markets. Functions of prices and principles of supply and demand in price determination.
405. **Agricultural Policy (3). Pr., AS 202 or EC 200 and junior standing.**
Concepts, objectives and operation of public policies affecting agriculture. Development of agricultural policies in the United States.
409. **Land Economics (5). Pr., AS 202 or EC 200 and junior standing.**
Principal economic and institutional factors affecting man and his use of land. Supply, demand, and future requirements for land. Property rights, land use planning, zoning, taxation and other social controls affecting land utilization.
410. **Agricultural Business Management (3). Pr., AS 202 or EC 200 and junior standing.**
Principles and problems involved in acquiring, organizing and operating successful agricultural businesses, capital requirements for selected agricultural businesses, factors affecting location and growth, and measures of technical and economic efficiency in organization and operation; practices involved in buying, pricing, and merchandising; management problems and policies in financing, personnel, and public relations.
412. **Economic Aspects of Water Resources Management (5). Pr., junior standing.**
The supply, demand, and use of water resources including economic, legal, and political dimensions. Economics of management of water resource use and conservation in terms of present and future supplies and needs. Both public and private water resources will be considered.

460. **Introduction to Econometrics (5).** Pr., MH 161 or equivalent, EC 274 or equivalent, and AS 202 or equivalent, and junior standing.
Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis.
490. **Senior Seminar (1).** Lec. 1. Pr., senior standing.
Current developments in Agricultural Economics; the role of Agricultural Economics in the general economy.
499. **Directed Studies in Agricultural Economics (1-5).** Pr., junior standing.
Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. Employment experience with a variety of agribusiness and agencies may serve as the focus.

GRADUATE COURSES

601. **Advanced Farm Management (5).**
Advanced theory and application of farm management principles and other economic concepts in agriculture. Organization, operation, and management of various types of farms. Optimum utilization of available resources on individual farms.
602. **Advanced Agricultural Prices (5).** Pr., EC 274.
Methods of price analysis, separation of fluctuations from price trends, measurement of changes in supply and demand of farm products. Prices, price trends, price cycles, and other price structures.
603. **Advanced Land Economics (5).**
Man and his use of land as related to institutional factors. Economics of natural resource use, economic feasibility, benefit-cost analysis, economics of environmental control, and factors related to rural and urban land use.
605. **Advanced Agricultural Marketing (5).**
Theory of marketing with emphasis on its application to methods used and problems faced in marketing farm products. Objectives in agricultural marketing.
606. **Agricultural Market Organization (5).** Pr., EC 451.
The theoretical approach to marketing problems characterized by imperfectly competitive structures and multiple markets separated by time, space, and form attributes. Theory of interregional trade and location of economic activity. Efficiency of firms and product movement.
608. **Economics of Agricultural Production (5).** Pr., EC 451.
Resource allocation and efficiency of production. Production and efficiency in the firm, between firms, and between agriculture and other industries. Influences on agricultural resource allocation and efficiency of risk and uncertainty including price instability, institutional changes, technological advances, imperfect knowledge of production methods, and variations in the human element with emphasis on the role of management.
609. **Dynamics of Agricultural Production and Management (5).** Pr., AS 608.
Dynamics of resource allocation and efficiency of production as influenced by price, institutional, and technological changes. Imperfect knowledge and the human element in management.
611. **Economic Development of Rural Resources (5).**
Theoretical and empirical study of economic growth and development; problems of undeveloped and underdeveloped areas; role of agriculture in a developing economy; examination of policies and programs for effective growth and development.
616. **Resource Economics, Policies and Programs (5).**
Impact of resource development on regional economic growth. Effect of taxation and tax policies. Interaction between technological change, resource use, and economic growth. Analysis of current policies and programs.
620. **Directed Readings in Regional Planning (5).** Pr., consent of instructor.
Assigned readings and pursuant discussions on delineation of economic areas, resource use and allocation, economic regions, watershed development, planning legislation, zoning, housing, land use restrictions, conservation, and recreation.
621. **Regional Planning Analysis (5).**
Theories of regions and problems of multi-jurisdictional planning. Analysis of metro-area and regional planning by states. Comprehensive planning by agencies such as TVA, Corps of Engineers, BOR, and Appalachian Commission. Regional planning and intergovernmental relations.
670. **Research Methods in Agricultural Economics (3).** Pr., graduate standing and consent of instructor.
680. **Special Problems in Agricultural Economics.** Credit to be arranged.
690. **Seminar (1-1-1).** Fall, Winter, Spring.
699. **Research and Thesis.** Credit to be arranged.

Rural Sociology (RSY)

261. **Rural Sociology (5).**
The basic sociological concepts and principles as applied to life in the rural community. Special attention given to the culture, social organization, and social problems of rural people in the United States, and in the South in particular. Credit not allowed in this course and SY 201.
362. **Community Organization (5). General elective.**
Understanding the principles of community organization and effective citizenship. Survey of institutions, organizations, and agencies interacting to meet community needs.
370. **Methods of Social Research (5). Pr., RSY 261 or SY 201.**
The principal methods of data collection and analysis in sociological research.
461. **Rural Social Organization (5). Pr., RSY 261 or SY 201 and junior standing.**
Nature of rural social organizations with emphasis on their structure, function and change. Extent to which organizations meet needs of rural people and principles of improving effectiveness.
462. **Sociology of Community Development (5). Pr., RSY 261 or SY 201 and junior standing.**
Various approaches to development of human resources and planning of changes within the total community. Development in different types of communities in the U.S. and world is considered with emphasis on small population centers.
499. **Directed Studies in Rural Sociology (1-5). Pr., junior standing.**
Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. May be used to complement and expand on an employment experience.

GRADUATE COURSES

641. **Extension Philosophy, Programs and Methods (5).**
An in-depth consideration of extension orientation in adult and continuing education in U.S. and developing nations. The Cooperative Extension Service is analyzed as an educational institution. Fundamental steps in program development and evaluation.
661. **Sociology of Regions (3).**
Social and demographic phenomena having implication for regional planning and development with emphasis on Southern region and subregions. Intra and inter-regional influences, socio-cultural structure, value orientations, population, changes and trends, and metropolitanization.
662. **Social Systems and Communities (3).**
Interrelationship of institutions and organizations within the community and to larger societal systems—regional and national. Emphasis on small towns and metropolitan centers relative to planning community change.
670. **Research Methods in Sociology (3). Pr., graduate standing and consent of instructor.**
680. **Special Problems in Rural Sociology. Credit to be arranged.**

Agricultural Engineering (AN)

Professor Kummer, *Head*

Associate Professors Renoll and Busch

Assistant Professors Flood, Hermanson, Koon, and Rochester

Research Lecturers Gill, Reaves, Taylor, Hendrick, and Schaefer

301. **Mechanics of Farm Machines (3). Lec. 2, Lab. 3. Pr., ME 321, MH 265, IE 204.**
Basic concepts and engineering principles of farm machinery, including basic design, power needs and their measurement, functional and economic analysis, utilization and management, testing, and safety as related to farm machines.
302. **Mechanics of Tractor Power (3). Lec. 2, Lab. 3. Pr., MH 265, IE 321, ME 301, IE 204.**
Basic concepts and engineering principles of the farm tractor, including mechanics of the tractor, stability, traction, weight transfer, thermal efficiency, energy sources, economics, safety, testing and power measurement as related to tractors and power units.
303. **Soil and Water Engineering I (4). Lec. 3, Lab. 3. Pr., ME 340, IE 204.**
Surveying procedures and application to soil and water problems. Rainfall-runoff relationships. Soil erosion mechanics and control methods. Upstream flood control analysis and design.
304. **Drainage and Irrigation Engineering (3). Lec. 2, Lab. 3. Pr., AN 303.**
Soil-water-plant relationships. Theory and design of drainage systems. Irrigation systems design. Water quality and supply. Legal and economic aspects.

305. **Agricultural Processing Engineering (3).** Lec. 3. Pr., ME 301, ME 340.
Introduction to process engineering, fundamental concepts, theory of unit operations such as pumps, fans, size reduction, cleaning, bulk movement, and heat transfer and mass transfer.
306. **Electrical Systems in Agriculture (3).** Lec. 3. Pr., EE 273, Coreq., EE 381.
Application of electrical power, equipment and control devices to agricultural systems. Special emphasis on safe and efficient power distribution, motor selection and performance, and theory and performance of sensing and control devices.
307. **Agricultural Structures Design I (3).** Lec. 2, Lab. 3. Pr., ME 207.
Analysis and design of structural systems of agriculture.
350. **Soil and Water Technology (5).** Lec. 4, Lab. 3. Fall, Spring, Summer.
Technical application of soil and water resources management. Irrigation system planning and equipment selection.
351. **Agricultural Machinery Technology (5).** Lec. 4, Lab. 3. Fall, Spring, Summer.
Agricultural machinery: utilization, management, selection, and economic justification.
352. **Tractor and Engine Technology (5).** Lec. 4, Lab. 3. Winter.
Tractors and engines. Operation, fuels used, size selection, utilization, and economic justification.
353. **Farm Building Technology (5).** Lec. 4, Lab. 3. Winter.
Selection of materials, methods of construction and functional needs of modern farm buildings.
354. **Agricultural Processing Technology (5).** Lec. 4, Lab. 3.
Agricultural processing systems; includes storing, drying, pelleting, mixing and automatic materials handling systems.
401. **Agricultural Power and Machinery Design (3).** Lec. 2, Lab. 3. Pr., AN 301, AN 302 and junior standing.
Design of equipment and systems to apply engineering principles to solutions of agricultural power and machinery problems. Functional requirements, safety, reliability, service conditions, power measurement, useful life, and creative design are combined to obtain designs for agricultural machine and power units.
403. **Soil and Water Engineering II (3).** Lec. 2, Lab. 3. Pr., AN 304 and junior standing.
Small watershed hydrology. Open channel hydraulics applied to the design of irrigation, drainage, and erosion control facilities. Hydraulic design of conduits, and stilling basins.
405. **Electrical and Processing Systems Design (3).** Lec. 3. Pr., AN 305, AN 306 and junior standing.
Design and layout of material handling systems, fundamental theory of particle movement, study of sensing and feed-back systems to include automatic controls and servo-mechanisms.
407. **Agricultural Structures Design II (3).** Lec. 3. Pr., AN 307 and junior standing.
Functional requirements and design of animal shelters and agricultural storage buildings.
- 410-411. **Special Problems (3-3).** Pr., Faculty adviser approval and AN 301-07.
Individual student endeavor supervised by instructor involving special Agricultural Engineering topics to which the engineering electives selected by the student will be complementary.
422. **Farm Power and Equipment (5).** Summer. Half-quarter course. Pr., AN 351, junior standing. For Vocational Agriculture Teachers.
424. **Farm Electrification (5).** Summer. Half-quarter course. Pr., junior standing. For Vocational Agriculture Teachers.
426. **Farm Irrigation (5).** Summer. Half-quarter course. Pr., junior standing. For Vocational Agriculture Teachers.
432. **Engineering in Agriculture I—Agricultural Machinery (3).** Lec-Dem. 4. Pr., graduate standing.
The utilization of modern agricultural machinery on the farm with emphasis on safety, management, costs, economic justification, and principles of operation. (Credit for both AN 432 and AN 422 may not be used to meet requirements for the Master's degree.)
434. **Engineering in Agriculture II—Agricultural Power (3).** Lec-Dem. 4. Pr., graduate standing.
Farm tractor and power units used on the farm; includes the basic principles of operation with major interest toward lubrication, costs, operational problems, safety and a comparison of gasoline, Diesel, and LP gas fuels, and units. (Credit for both AN 434 and AN 422 may not be used to meet requirements for the Master's degree.)

COURSES PRIMARILY FOR GRADUATE STUDENTS

601. **Advanced Small Watershed Hydrology (4).** Pr., AN 403, CE 412.
Hydrograph synthesis. Mathematical modeling of runoff and streamflow. Probability analysis of hydraulic events. Design of upstream systems for flood and erosion control and water supply.
602. **Advanced Farm Power and Machinery (5).** Pr., AN 401.
Principles of operation and analysis of design of basic machine elements, hydraulic systems and functional requirements of farm power units, agricultural machinery and materials of construction.

603. **Erosion and Sediment Transport (4).** Pr., AN 403.
Mechanics of overland flow and the initiation of sediment movement. Analysis of alluvial channel flow. Theory of sediment transport. Channel stability and regime theory.
604. **Agricultural Engineering Problems.** Credit to be arranged not to exceed a total of 5 hours.
Special advanced engineering and design problems.
605. **Soil Dynamics of Tillage and Traction (3).** Pr., CE 418, or AY 455 and consent of instructor.
Analysis and measurements of soil reactions, as affected by the physical properties of the soil, when subjected to forces imposed by tillage implements and traction devices. Considered are shear, cohesion, adhesion, consolidation, plasticity and abrasion soil properties.
606. **Agricultural Engineering Management 3 cr. Pr., 25 cr., in Math.**
Application of the principles of engineering management and economy to the design, development and use of engineering systems in agriculture: Economic evaluations of engineering proposals, inventory theory in the selection and maintenance of agricultural equipment, replacement theory, application of CPM and PERT to scheduling under uncertainty, applications of linear programming, machine reliability, warranties and patents.
607. **Engineering Principles of Animal Environment (3)** Lec. 3, Pr., AN 407 or consent of instructor.
Design and analysis of environmental equipment and systems for control or modification of animal production. Emphasis on evaluation of environmental factors which influence total environment.
608. **Seminar.** Credit to be arranged. All quarters.
Reviews and discussions of research techniques, current scientific literature and recent developments in agricultural engineering research.
699. **Research and Thesis.** Credit to be arranged.
May be taken more than one quarter.
799. **Doctoral Research and Dissertation.** Credit to be arranged.

Agronomy and Soils (AY)

Professors Ensminger, *Head*, Adams, Cope, Donnelly, Hiltbold, Hood, Hoveland, Johnson, Rogers, Scarsbrook, and Wear
Associate Professors Buchanan, C. Evans, E. Evans, and King
Assistant Professors Bennett, Berry, Dickens, and Hajek
Research Lecturers Pearson and Taylor

201. **Principles of Grain Production (5).** Lec. 4, Lab. 2. Winter, Spring.
Fundamental factors involved in the economic production of corn, small grains, grain sorghum, peanuts and soybeans.
304. **General Soils (5).** Lec. 4, Lab. 2. Winter, Spring. Pr., CH 105 and 105L or CH 207.
The formation, classification, composition, properties, management, fertility, and conservation of soils in relation to the growth of plants.
305. **General Soils (5).** Lec. 4, Lab. 2. Winter. Pr., CH 103-104.
The formation, classification, composition and properties of soils and their influence on vegetative growth and development on forest lands. Open only to students in Forestry.
307. **General Soils (5).** Lec. 4, Lab. 2. Fall, Spring. Pr., CH 103-104.
The general field of soils including genesis, classification and fertility.
310. **Earth Science (5).**
Materials of the earth; forces that shape and sculpture the earth's surface, including weathering, water, soil formation and erosion; soil geography; and historical geology. (Not open to students in School of Agriculture. Credit toward degree may not be earned in both this course and a General Soils course.)
311. **The Philosophy of Agricultural Sciences (3).** Winter.
Principles of agricultural science illustrated by current and historical examples.
401. **Principles of Forage Production (5).** Lec. 4, Lab. 2. Fall, Spring. Pr., junior standing.
Grass and legume forage crops. The crops are considered from the standpoint of (a) pasture crops, (b) hay and silage crops, (c) soil improving crops.
402. **Soil Fertility (5).** Lec. 5. Spring. Pr., AY 304, 305 or 307, and junior standing.
Lectures, demonstrations and problems illustrate principles of soil fertility as related to fertilizer practices and crop production. An advanced course required of all students majoring in Agronomy and Soils. Either AY 402 or AY 407, but not both, may be used to satisfy the minimum requirement for the Master's degree.
404. **Fiber and Oil Crops (5).** Lec. 5. Winter. Pr., junior standing.
Most of the time will be devoted to cotton, soybeans and peanuts with a limited amount of time devoted to other fiber and oil crops.

405. **Turf and Its Management (3).** Lec. 2, Lab. 2. Fall. Pr., AY 304, BY 306, and junior standing.
Species of turf crops in relation to latitude, soil type, shading, establishment, fertility, and maintenance.
406. **Commercial Fertilizers (3).** Lec. 3. Winter. Pr., AY 304, 305 or 307, or by special permission of instructor; also junior standing.
Raw material reserves; manufacture, and properties of fertilizer materials, properties and formulation of mixtures; relative efficiency of various plant nutrient sources; and related agronomic problems.
407. **Soil Management (5).** Lec. 5. Summer. Pr., AY 304, AY 305, or AY 307, and junior standing.
Physical, chemical and biological properties of soils and their management. An advanced course designed for students in Vocational Agriculture. Either AY 402 or AY 407, but not both, may be used to satisfy the minimum requirement for the Master's degree.
408. **Soil Resources and Conservation (5).** Lec. 4, Lab. 2. Fall. Pr., AY 304, 305 or 307 and junior standing.
Soils as a natural resource for land-use planning; their classification and management for crop production, recreation, and urban and industrial development.
409. **Seed Production (3).** Spring, odd years. Pr., AY 201, or 401 and junior standing.
Methods and factors affecting production, storage, and processing seed.
410. **Methods of Plant Breeding (5).** Lec. 4, Lab. 2. Fall, even years. Pr., ZY 300 and junior standing.
A general course in the principles and methods of plant breeding.
414. **Principles and Use of Herbicides in Crop Production (5).** Fall. Lec. 4, Lab. 2. Pr., CH 104 and junior standing.
Principles and use of herbicides in agronomic crops. Acquaints the students with methods of application including equipment, time of application, methods of incorporation and formulation of herbicides. The fate of herbicides in soil and the ecological impact on succeeding plant species.
415. **Soil Morphology (5).** Lec. 3, Lab. 4. Spring. Pr., AY 304, 305 or 307 and junior standing.
Physical, chemical and mineralogical properties of soils are studied in relation to their classification for engineering and agricultural uses.
455. **Soil Physics (5).** Fall, odd years. Pr., AY 304 and junior standing.
Lectures and demonstrations to illustrate fundamental physical properties of soils.
499. **Special Problems (1-5).** Credit to be arranged. Pr., departmental approval and junior standing. Not open to graduate students.
Students will work under the direction of a staff member on special problems in crop or soil science.

GRADUATE COURSES

601. **Agronomy Problems (1-5).** Credit to be arranged.
Conferences, problems, and assigned reading in soils and crops, including results of agronomic research from the substations and experiment fields.
606. **Soil Microbiology (5).** Lec. 3, Lab. 4. Spring, odd years. Pr., AY 402 and VM 200.
Soil microorganisms and their physiological processes related to soil development and plant nutrition. The role of microorganisms affecting the chemical and physical properties of soils will be studied, with emphasis on the cyclical transformations of nitrogen, phosphorous, carbon, and sulfur.
608. **Experimental Methods (5).** Fall, even years.
Experimentation in the agricultural sciences including experimental techniques, interpretation of research data, use of library references and preparation of publications; and consists of problems, assigned readings, and lectures.
615. **Seminar in Genetics (1).** Pr., ZY 300.
Reports by students and staff members on current research and the literature in the field of genetics.
616. **Advanced Plant Breeding (5).** Lec. 4, Lab. 2. Winter, even years. Pr., ZY 300.
Principles, methods, and techniques involved in plant breeding. Laboratory work will consist of studying active plant breeding programs, studying pollination techniques, and making pollinations. A term paper will be required.
617. **Experimental Evolution (5).** Spring, even years. Pr., ZY 300 and AY 616.
The factors affecting the evolution of species.
618. **Crop Ecology (5).** Winter, even years. Pr., BY 306 and AY 402.
World population and food production problems. Origin, distribution and adaptation of crop plants as influenced by environment with emphasis on climatic factors. Lectures and reading from current literature.

619. **Theories in Forage Crops Management (5). Lec. 3, Lab. 4. Winter, odd years. Pr., BY 306 and AY 402.**
Principles involved in successful establishment, maintenance, and management of crops used for grazing, hay and silage. Several field trips will be made to research stations and private farms to observe management practices.
654. **Advanced Soil Fertility (5). Spring, even years. Pr., AY 402.**
Composition, properties and management of soils in relation to the nutrition and growth of plants.
655. **Soil and Plant Analysis (5). Lec. 2, Lab. 6. Winter, odd years. Pr., CH 206 and AY 402.**
Principles, methods, and techniques of quantitative chemical analysis of soils and plants applicable to soil science.
656. **Soil Clay Mineralogy (5). Lec. 4, Lab. 2. Fall, even years.**
Crystal structure and properties of the important clay size minerals of soils and clay deposits combined with identification techniques involving X-ray diffraction and spectroscopy, differential thermal analysis, electron microscopy, specific surface analysis, and infrared absorption.
657. **Soil Chemistry (5). Fall, odd years. Pr., CH 407 and AY 402.**
Interpretation of soil properties and chemical reactions in terms of ion exchange, solubility diagrams, solution equilibria, electrochemistry, and electrokinetics of charged particles.
658. **Advanced Soil Physics (5). Lec. 2, Lab. 6. Pr., MH 263, PS 205-206, and AY 455.**
Physical properties of soils in relation to plant growth. Emphasis is placed on methods of measuring soil physical properties and the interpretation of these measurements in terms of plant growth.
699. **Research and Thesis. Credit to be arranged.**
Research and thesis on problems related to crop production, plant breeding, soil fertility and soil chemistry.
799. **Doctoral Research and Dissertation. Credit to be arranged.**

Animal and Dairy Sciences (ADS)

Professor Warren, *Head*, Anthony, Autrey, Cannon, Hawkins, Patterson, Smith, and Strength

Associate Professors Daron, Harris, Huffman, Parks, Rollins,

Squiers, Tucker, Turney, and Wiggins

Assistant Professors McCaskey and Zabel

Instructor Little

101. **Man's Food (3). Lec. 3. Fall, Winter, Spring.**
Analysis of the world food supply; problems of food availability and distribution; methods of alleviating food shortages; role of the food processor.
200. **Introductory Animal and Dairy Sciences (5). Lec. 4, Lab. 2. Fall, Winter, Spring.**
Provides some understanding of the scope and importance of the field. The importance of livestock to agriculture and to the nutrition of people. The role of nutrition, breeding, selection and management in livestock production.
204. **Animal Biochemistry and Nutrition (5). Fall, Winter, Spring. Pr., CH 104.**
Principles of animal biochemistry and nutrition and the nutritional requirements of farm animals.
301. **Livestock Judging (3). Lec. 1, Lab. 4. Winter, Spring. Pr., ADS 200.**
Theory and practice in the selection of beef cattle, swine, sheep and horses.
302. **Feeds and Feeding (3). Fall, Spring. Pr., ADS 204.**
Principles and practices of balancing and compounding of rations for beef and dairy cattle, sheep, and swine.
303. **Livestock Production (5). Lec. 4, Lab. 2. Winter. Pr., ADS 204.**
Efficient practices for selection and management of beef and dairy cattle and swine. For students in Agricultural Education, and Agricultural Economics and Rural Sociology. Credit in ADS 401, ADS 402, or ADS 404 excludes credit for ADS 303.
309. **Live Animal and Carcass Evaluation (3). Lec. 1, Lab. 4. Spring. Pr., ADS 200.**
Classifying and grading market hogs, cattle and sheep with major emphasis on indicators of carcass merit. Carcass grading, yield grading and evaluation.
310. **Meat and Meat Products (3). Lec. 2, Lab. 2. Fall, Winter. General Elective.**
Theory and practice of processing, preservation, selection and uses of meats.
314. **Dairy Cattle Judging (3). Lec. 1, Lab. 4. Pr., ADS 200.**
Theory and practice in the selection of dairy cattle.
401. **Swine Production (5). Lec. 4, Lab. 2. Fall, Spring. Pr., ADS 200, ADS 204, junior standing.**
Practical problems involved in the breeding, feeding, and management of swine for economic production.

402. **Beef Cattle Production (5).** Lec. 4, Lab. 2. Fall, Winter. Pr., ADS 200, ADS 204, and junior standing.
Practical phases of breeding, feeding, and management of beef cattle for economic production.
403. **Animal Breeding (5).** Lec. 4, Lab. 3. Winter. Pr., ZY 300 and junior standing.
Application of genetic principles to the breeding of cattle, sheep, and swine. Studies of different systems of breeding and selection and their related efficiencies for livestock improvement.
404. **Dairy Cattle Production (5).** Lec. 4, Lab. 2. Spring. Pr., ADS 200, ADS 204, and junior standing.
Practical phases of breeding, feeding and management of dairy cattle for economic production.
405. **Physiology of Lactation (5).** Lec. 4, Lab. 2, Spring. Pr., junior standing and departmental approval.
Anatomy and physiology of milk secretion; milk precursors; factors affecting composition of milk.
406. **Animal Reproduction (5).** Lec. 4, Lab. 2. Fall. Pr., junior standing.
Anatomy and physiology of the male and female reproductive tract; hormones; estrus and estrus cycle; ovulation; mating, gestation, parturition; sperm physiology; collection, storage and dilution of semen; artificial insemination; fertility; sterility; pregnancy tests.
407. **Advanced Livestock Judging (3).** Lec. 1, Lab. 4. Fall. Pr., ADS 301 and approval of instructor.
An advanced course in the selection and grading of livestock.
408. **Applied Animal Nutrition (5).** Lec. 4, Lab. 2. Winter. Pr., ADS 204, ADS 302 and junior standing.
Animal nutrition and application to the production of farm animals, including physiology of nutrition, metabolism of nutrients and recent nutritional developments.
409. **Horse Production (3).** Lec. 2, Lab. 2. Spring.
The selection, breeding, feeding, management and use of horses in the Southeast.
410. **Meat Technology (3).** Lec. 2, Lab. 2. Winter. Pr., ADS 310, and junior standing.
Meat curing and processing procedures and the biochemical alterations of meat during aging, curing and processing.
411. **Dairy Chemistry (5).** Lec. 3, Lab. 4. Fall. Pr., CH 208 and junior standing.
Chemistry of milk constituents; interaction of constituents with one another under various conditions; analysis of milk, milk constituents, and milk products.
- 412-413. **Processing Dairy Products (5-5).** Lec. 3, Lab. 6. Winter, Spring. Pr., junior standing.
Application of processing operations to the processing of dairy products; special processing techniques; quality control of products.
414. **Food Microbiology (5).** Lec. 3, Lab. 4. Spring. Pr., BY 300.
The relationship of habitat to the occurrence of microorganisms on food; environment affecting the growth of various microorganisms in food; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs; and public health and sanitation bacteriology.
415. **Food Plant Sanitation (3).** Lec. 2, Lab. 2. Winter. Pr., junior standing.
Sanitary regulations of food plants. Principles and procedures of cleaning and sanitizing food handling equipment.
418. **Biochemistry (5).** Lec. 4, Lab. 3. Fall. Pr., CH 204, CH 204L, CH 208 and junior standing.
Classification, structure and chemistry of the major chemical constituents of living matter.
(Same course as CH 418)
419. **Biochemistry (5).** Lec. 4, Lab. 3. Winter. Pr., ADS 418 or its equivalent.
Introduction to metabolism. (Same course or CH 419.)
420. **Undergraduate Seminar (1).** Winter. Pr., senior standing.
Lectures, discussions and literature reviews by staff, students and guest lecturers.
490. **Special Problems (1-5).** Credit to be arranged. Pr., departmental approval and junior standing. Not open to graduate students.
Students will work under the direction of staff members on specific problems.

GRADUATE COURSES
(Graduate Standing Required)

600. **Meat Science (5).** Pr., ADS 410.
A comprehensive study of the chemical, physical, histological and bacteriological properties of meats.
602. **Technical Control of Dairy Products (5).** Pr., ADS 411, 413, 414.
Advanced methods of analyses of dairy products and the relation between composition and processing methods.

607. **Comparative Animal Nutrition (3). Fall. Pr., ADS 408.**
Advanced comparative nutritional requirements in beef and dairy cattle, sheep, swine and laboratory animals.
608. **Advanced Animal Reproduction (5). Pr., ADS 406, ZY 424.**
Physiology and endocrinology of reproduction.
609. **Advanced Beef Cattle Production (5).**
Advanced studies relating to the production of beef cattle.
610. **Advanced Swine Production (5).**
Advanced studies of swine production.
611. **Seminar. Credit to be arranged.**
612. **Genetics of Populations (5). Pr., ADS 403.**
Genetic composition of populations and factors affecting rates of change and conditions of equilibrium.
614. **Minerals (5). Pr., CH 208 and satisfactory courses in animal nutrition.**
The specific functions of minerals in animal metabolism.
615. **Ruminant Nutrition (5). Pr., ZY 424 and ADS 419.**
Rumen fermentation and the biochemistry of ruminant metabolism.
617. **Microbial Biochemistry (5). Fall. Pr., 5 hours of microbiology and ADS 419.**
The anatomy, growth and metabolism of the bacterial cell with emphasis on the biochemical makeup of the cell and the regulation of its activities; the use of microorganisms for quantitative assays.
618. **Current Problems and Practices in Livestock Farming (5). Summer.**
Intensive studies of new research findings and their application to livestock production on Alabama farms. Primarily for Vocational Agriculture Teachers and County Extension Workers.
619. **Experimental Methods (5). Pr., satisfactory courses in statistics.**
Research methods in the animal sciences including design of experiments, experimental techniques, analysis and interpretation of data, evaluation of research literature and preparation of publications.
620. **Experimental Pathology of Metabolic Diseases (5). Pr., VM 418, satisfactory courses in histology, biochemistry, physiology and general pathology.**
A comprehensive study of the structural and functional changes associated with metabolic diseases.
641. **Proteins (5). Pr., ADS 419 & CH 407 or its equivalent.**
Chemical and physical properties of amino acids and proteins, protein structures, and the relation of protein structure to function.
642. **Lipids (5). Pr., ADS 419 or its equivalent.**
Chemistry of the lipids and their biological significance.
643. **Enzymes (5). Pr., ADS 419 or its equivalent.**
The principles of enzyme chemistry including the physical, chemical and catalytic properties of enzymes; classification of enzymes; and enzyme formation.
644. **Topics in Biochemistry (2-6 hrs. credit - to be arranged). Pr., ADS 419, or its equivalent and approval of instructor.**
Advanced study in selected areas of metabolism and the techniques for characterization of macromolecules.
645. **Biochemical Research Techniques (5). Pr., ADS 419 or its equivalent.**
Modern biochemical laboratory techniques.
690. **Special Problems. (1-5 hours. Credit to be arranged.)**
Conference problems, assigned reading and reports in one or more of the following major fields: (a) animal biochemistry and nutrition, (b) animal breeding and genetics, (c) physiology of reproduction, (d) nutritional pathology, (e) animal production, (f) experimental pathology, (g) histochemistry, (h) meats, and (j) dairy products.
699. **Research and Thesis. Credit to be arranged.**
Research and thesis may be on technical laboratory problems or on problems directly related to beef cattle, dairy cattle, sheep or swine.
799. **Doctoral Research and Dissertation. Credit to be arranged.**

Architecture (AR)

Professors Millman, *Head*, McPheeters, Pfeil, Schaer, Snow, and Speer
Associate Professors Carter, Davis, Doerstling, and Latta
Assistant Professors Bryant, Faust, Samuelson, and Zwirn
Instructors Griffin, Hatcher, and Rabby
Visiting Assistant Prof. Akalin

Architecture Program (AR)

- 110-111. Design Fundamentals (5-5). Lab. 10-10. (Pr., Acceptance into the AR, ID or IND Curriculum.)**

Architectural technical drawing and beginning architecture rendering. Basic design communication techniques and experiments in two and three dimensional design.

- 201-202-203. Architectural Design (5-5-5). Lec. 2-2-2, Lab. 10-10-10. Pr., Ar 110, 11 and AT 105.**

Man and his needs as the primary influence in shaping space, form, and function; approach to a design methodology and understanding of structure.

- 301-302-303. Architectural Design (5-5-5). Lab. 15-15-15. Pr., A student must receive a grade of "C" or higher in AR 201, 202, and 203, to be admitted to AR 301. The School reserves the right to refuse advancement to the student regardless of grades if, in the opinion of the faculty, the student does not exhibit real potential for the profession.**

Analysis and solution of building design problems of moderate complexity; emphasis on environmental considerations and introduction of building systems.

- 360. Appreciation of Architecture (3). General elective. Pr., sophomore standing. (Not open to AR and ID students.)**

Architectural development with particular attention to American and contemporary examples. Illustrated lectures, reading, essays.

- 361-2-3-4. History and Theory of Architecture (3-3-3-3). Pr., sophomore standing.**

The development of architecture from ancient times through contemporary examples. The cultural and social milieu, as well as the technology of each period will be investigated to better understand the basic determinants of architectural form. Composition of architectural space, town planning, and landscape architecture will be considered. Illustrated lectures, readings, drawings, and reports.

- 370. Spaces for Living (3). General elective. Pr., junior standing. (Not open to AR and ID students.)**

Contemporary concepts of design, spatial organization, materials, furnishings, and gardens in relation to all major types of residential architecture. Illustrated lectures, readings, reports.

- 401-402-403. Architectural Design (5-5-5). Lab. 15-15-15. Pr., AR 303, Coreq., BT 313.**

Buildings of advanced complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.

- 435. Art and Architecture Seminar (3). Pr., 4th year standing.**

Readings, discussions, and projects on the relation of the graphic and plastic arts to architecture.

- 460. The Architect and Society (3). Pr., 4th year standing.**

The social, economic, and political factors which have influenced the contemporary expression of architectural design and practice. Analysis of great works and philosophies which led the way to new approaches in design. Appreciation of aesthetics and function as applied to form. Lectures, outside reading and reports.

- 465-466. Architectural Design (5-5). Lab. 15-15. Pr., AR 403.**

Advanced problem solving processes and synthesis of previous design experiences; consideration of total scope of professional concerns, from architectural detailing to community design.

- 467. Architectural Design (7). Lab. 21. Pr., AR 466, AR 499.**

The extensive development of an architectural problem of the student's choice, under direction of the Committee on Design. Drawings, models, details, and written explanations, oral and/or published presentation for jury consideration.

- 471-472. Professional Practice (3-3). Pr., 5th year standing.**

Procedures in architectural practice; construction methods, estimation of quantities and costs. Office organization; legal requirements; professional organizations and relations; civic responsibility, professional ethics.

- 474. Introduction to Urban Planning (3). Pr., 4th year standing.**

The basic forces and influences shaping urban growth and development; a survey of city planning history and theory and an examination of public policy.

- 476. Seminar in Contemporary Concepts (5). Pr., AR 364.**

Exploration of twentieth century ideas of the art and/or science of architecture, and theoretical bases for architectural design.

- 477. Seminar in Historical Problems (5). Pr., AR 364.**

Open to students who have shown ability, initiative, and industry in developing individual projects. Research, reports, and drawings under supervision on approved topics.

- 478. Seminar in Technological Problems (3). Pr., 4th year standing.**

Current technological advances in the building industry and evaluation of their impact upon architecture.

- 479. Seminar in Architectural Literature (3). Pr., 4th year standing.**

A guided study and discussion of selected readings.

- 481. Computers in Architecture (3). Pr., 3rd year standing.**

Survey of existing and emerging techniques of computer utilization in architectural design, production, and management.

495. **Special Problems.** Credit to be arranged up to 5 hrs. Pr., 3rd year standing.
Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the head of the Department. Evaluation of the work will be by faculty jury. May be taken more than one quarter.
499. **Design Research (2).** Pr., AR 465.
The selection and comprehensive programming of a terminal problem in architecture to be executed in AR 467.

Interior Design (ID)

Courses specifically required in the Interior Design curriculum

- 215-16-17. **Elements of Interior Design (3-3-3).** Lec. 1, Lab. 3. Pr., AR 111.
The profession of interior design including professional procedures, relationships, ethics, correlation with architecture and other arts. Lectures, readings, discussions and research.
- 305-6-7. **Interior Design (5-5-5).** Lab. 15-15-15. Pr., AR 203. Admission upon recommendation of the Committee on Design.
Analysis and solution of interiors of moderate complexity, with emphasis on domestic and commercial problems. Research, discussion, drawings, models.
- 365-6. **Period Interiors (5-5).**
The development of interior spaces, furniture, fabrics, and accessories from pre-Renaissance to 1900. Illustrated lectures, readings, reports, and field trips.
367. **Contemporary Interiors (3).** Lec. 2. Pr., AR 366.
The fundamental aspects of interior design, spatial order and characteristics, furniture and fabric design, from 1900 to date. Illustrated lectures, readings, reports.
- 405-6. **Interior Design (5-5).** Lec. 2-2, Lab. 9-9, Pr., AR 307. Admission upon recommendation of the Committee on Design.
Analysis and solution of interiors of advanced complexity, with emphasis on institutional and public problems. Research, discussions, drawings, models.
407. **Interior Design (7).** Lec. 2, Lab. 15. Pr., AR 406.
The development of a major design problem under the direction of the Committee on Design. Drawings, models, details; oral presentation for jury consideration.
408. **Interior Design Research (2).** Lec. 1, Lab. 3. Coreq., AR 406.
The selection and comprehensive programming of a terminal problem in interior design to be executed in AR 407.
441. **Professional Practice (3).** Lec. 1, Lab. 3.
Office procedure and methods for interior designers; the techniques and execution of working drawings for buildings, cabinetry and interior details; specification. Discussions, drawings, inspections, reports.

Industrial Design (IND)

Courses specifically required in the undergraduate curriculum

210. **Industrial Design (5).** Lec. 1, Lab. 12. Pr., AT 105, AR 110 and 111. Admission only upon recommendation of the Committee on Design (1.00 overall).
The problems of visual communication. Perception theory, design fundamentals; color, figure organization, movement and balance, proportion and rhythm.
211. **Industrial Design (5).** Lec. 1, Lab. 12. Pr., IND 210 and consent of instructor.
An extension of principles encountered in Industrial Design 210. A study and analysis of Industrial Design Fundamentals.
212. **Industrial Design (5).** Lec. 1, Lab. 12. Pr., IND 211, and consent of instructor.
Structural and functional relationship of design elements; convenience, utility, safety, maintenance.
221. **Materials & Technology (5).** Lec. 5. Pr., sophomore standing.
The properties and use of various materials in manufacture and a study of the machine and tool processes used by industry. Survey from the Designer's viewpoint.
222. **Technical Illustration (5).** Lec. 5. Pr., sophomore standing.
Axonometric drawing, perspective, and freehand graphics, as used by Industrial Designers.
223. **Industrial Design Methods (5).** Lec. 5. Pr., sophomore standing.
The methods and organizational procedures employed in the analysis and solutions of design problems. Survey of philosophies and theories of design.
308. **Design Workshop (5).** Lec. 3, Lab. 6. Pr., IND 210, TS 111.
Modelmaking and creative modeling. Study Models, Presentation Models, Mock-ups, Prototypes.

310. **Industrial Design (5).** Lab. 15. Pr., IND 212, IND 222, IND 223, EG 105. Admission only upon recommendation of Committee on Design. (1.00 overall and 1.33 from IND 210, 211, 212.)
Design of machines and instruments. Arrangements of elements in systems.
311. **Industrial Design (5).** Lab. 15. Pr., IND 310, PS 204.
Design of domestic and office equipment.
312. **Industrial Design (5).** Lab. 15. Pr., IND 311.
Exhibition and packaging problems.
410. **Industrial Design (6).** Lec. 2, Lab. 12. Pr., IND 312.
Industrialized building. Building components produced by industrial means.
411. **Industrial Design (6).** Lec. 2, Lab. 12. Pr., IND 410. Admission only upon recommendation of Committee on Design. (1.25 overall and 1.50 from IND 310, 311, 312, 410.)
Design or re-design of products of advanced complexity.
412. **Industrial Design Thesis (6).** Lec. 2, Lab. 12. Pr., IND 411. Admission only upon recommendation of Committee on Design.
A project involving all design phases; project of the student's own selection and approved by the Committee on Design. Presentation of graphics, models and written explanations, and oral presentation before a Design Jury. The thesis material will be retained by the Department for one year.
415. **History of Industrial Design I (5).** Pr., IND 212.
Design from the first Industrial Revolution to the present, with emphasis on the relation between design and science, art, technology, and the humanities.

Courses for Advanced Undergraduates and Graduates

416. **History of Industrial Design II (5).** Lec. 5.
Design from the beginning of artifacts to the first Industrial Revolution, with emphasis on the relation between design and sciences, art, technology, and the humanities.
485. **Seminar in Industrial Design (5).** Lec. 5. Pr., 4th year standing.
Development of individual projects. Research, design, reports, on approved topics. May be repeated for a maximum of ten hours upon approval of Committee on Design.
486. **Case Studies in Design (5).** Lec. 3, Lab. 6.
Design projects undertaken by industry will be studied by examination of artifacts and records, by interviews with professionals responsible for phases of the projects, and by class discussions of this data and its implication. Focus on the socio-cultural relevancy of the artifacts.

Courses Primarily for Graduate Students

Individual courses available to graduate students in other fields.

- 601-602. **Principles of Design (5-5).** Lec. 2, Lab. 9.
The communication principles of form qualities, with emphasis of these principles to the technical and human factors of artifacts, and to the human visual environment.
605. **Design Management (5).** Lec. 3, Lab. 6.
The Industrial Design project management and development with emphasis on the inter-relational management concepts of research, product planning, production and marketing.
606. **Human Factors in Design (5).** Lec. 3, Lab. 6.
A theoretical and empirical examination of human factors (anthropometrics, Biotechnology, Engineering Psychology, Behavioral Cybernetics, Ergonomics) as applied to man-machine environment systems.
610. **Design Theories (5).** Lec. 3, Lab. 6.
An examination of Design Theories and Philosophies as related to technical artifacts in man-machine systems. Comparative studies of unifying theories in Art, Science, Design, Technology and the Humanities.
- 611-612. **Design Methodology (5-5).** Lec. 3, Lab. 6.
Industrial Design methodologies and scientific methods employed in research, analysis, synthesis and evaluation in comprehensive design problems. Emphasis on creativity and innovation.
- 613-614. **Systems Design (5-5).** Lec. 2, Lab. 9.
Systems approach and interdisciplinary team work to Design problems, inquiries into details of sub-systems, components, and parts, with emphasis on the relation of the performance of technical systems to optimal human factor effects.
- 620-621-622-623. **Industrial Design (5-5-5-5).** Lec. 1, Lab. 12.
Synthesizing studies in research, analysis, and application based on an interdisciplinary concept. The project content is according to the student's interest from one or several of the following design areas: Product Design, Industrialized Housing, Package Design, Corporate Communications, Transportation Design, Exhibition Design and Systems Implementation. Emphasis on the relation of products and systems to those who use them.
699. **Research and Thesis.** Credit to be arranged.
May be taken more than one quarter.

Urban and Regional Planning Program (URP)

Courses Offered to Graduate Planning Students and Others by Permission

200. **Graphic Communication (1), Lab. 3. (Not open to AR, IND or ID students.)**
A basic preparation in graphic techniques essential for communication of information and ideas for planning and urban design. Media and methods for mapping, diagramming, charting, and sketching are surveyed, analyzed, and applied. This is AR 200.
601. **History and Theory of Planning (5). Pr., graduate standing or permission.**
The historical development of cities and urban regions is examined with particular emphasis on the interaction of their dynamic and structural elements. The impact of the planner and the planning process on shaping public policy and influencing private developmental decision-making is examined.
605. **Urban Design (3). Pr., graduate standing or permission.**
Seminar concerned with the theory and practice of building cities and their supporting regions, seeking a theory and language or urban design. Special attention is directed toward the forces which shape our cities and the resulting organization of functional systems, buildings, and outdoor space at the urban scale.
615. **A Seminar on Current Planning Issues (3). Pr., graduate standing or permission.**
An examination of topical issues in the fields of urban regional planning.
620. **Urban Planning Analysis (5). Pr., URP 601 and URP 603.**
Field application and involvement at the "city" or "neighborhood" level; data collection and analysis; agency and program identification; problem definition and recommendation of strategic plan; emphasis on real-world problems with an actual client.
680. **Special Problems. Credit to be arranged up to five hours. Pr., graduate standing.**
Directed study in area of special interest. Arranged by student and adviser and approved by adviser. This is AR 680. May be repeated for a maximum of up to ten hours.

Art (AT)

Professors Abney, Sykes, and Williams

Associate Professors Hiers, *Head*, Hatfield, Kettunen, and Morton

Assistant Professors Harper, Hobbs, T. Mims, Olson,

Ross, Taugner, and Walls

Instructors Fitzpatrick, K. Mims, and Mitchell

105. **Drawing I (5). Lec. 2, Lab. 9.**
Representational drawing. Linear construction, proportion, freehand perspective, *chiaroscuro*, surface treatments.
106. **Drawing II (5). Lec. 2, Lab. 9. Pr., AT 105.**
Emphasis on creativity, composition and pictorial organization. Interpretive drawing.
107. **Drawing III (5). Lec. 2, Lab. 9. Pr., AT 105.**
Drawing in various media emphasizing a subjective approach to the human figure as form and as a compositional element.
113. **Perspective (3). Lec. 2, Lab. 3.**
Linear perspective. Shadows, Reflections.
181. **Design Fundamentals I (5). Lec. 2, Lab. 9.**
Plastic elements. Relationship of the arts. Problems in basic design.
182. **Design Fundamentals II (5). Lec. 2, Lab. 9. Pr., AT 105 and 181.**
Advanced application of principles encountered in AT 181.
205. **Figure Drawing I (5). Lec. 2, Lab. 9. Pr., AT 107.**
Drawing from the model in various media with emphasis on proportions, interpretation and expression.
211. **Lettering (5). Lec. 5. Pr., AT 181, 105 and TS 102.**
Historical development of letters. Anatomy of letters. Spacing. Drill experiences with pen. Fundamental alphabets and compositions of body matter lettered directly.
212. **Graphic Processes (5). Lec. 5. Pr., sophomore standing.**
Printing processes, photomechanical reproduction, copy-fitting, paper manufacture and usage, related subjects.
215. **Figure construction (5). Lec. 3, Lab. 6. Pr., AT 205.**
Lectures deal with form, function and operation of skeletal and muscular parts of the body. Drawing from casts, models, and skeleton.
222. **Painting I (5). Lec. 2, Lab. 9. Pr., AT 106, 182 and 113.**
Transparent water color. Study of the medium and of picture structure. Exercises in still life, figure and landscape painting.

224. **Painting II (5).** Lec. 2, Lab. 9. Pr., AT 106, 182 and 113.
Opaque water color. Techniques and properties of the medium. Objective and subjective handlings as a further extension and application of the plastic elements.
227. **Sculpture I (5).** Lec. 2, Lab. 9. Pr., AT 106 and 182.
Three dimensional expression. Clay and other media.
305. **Printmaking I (5).** Lec. 2, Lab. 9. Pr., AT 106 and 182.
Relief print media. Woodcut, linoleum cut and related techniques.
- 307-8. **Figure Drawing II and III (5-5).** Lec. 2-2, Lab. 9-9. Pr., AT 215.
Drawing from the model in various media, with emphasis on construction, interpretation, and expression.
317. **Packaging (5).** Lec. 2, Lab. 9. Pr., AT 381.
Applied problems in package design.
322. **Painting III (5).** Lec. 2, Lab. 9. Pr., AT 106, 182 and 113.
Introduction to oil painting. Materials and techniques of still life and figure as a means for aesthetic exploration.
324. **Painting IV (5).** Lec. 2, Lab. 9. Pr., AT 222, 224 and 322. 1.00 grade point average.
Painting with optional media and subject matter.
327. **Sculpture II (5).** Lec. 2, Lab. 9. Pr., AT 227.
Three dimensional expression. Emphasis placed on idea, form and technique.
338. **Art History I (5).** Lec. 5. Pr., sophomore standing.
Western painting, sculpture and architecture from pre-historic periods through the High Renaissance.
339. **Art History II (5).** Lec. 5. Pr., sophomore standing.
Western painting, sculpture and architecture from Mannerism through Post-Impressionism.
340. **Art History III (5).** Lec. 5. Pr., sophomore standing.
Western painting, sculpture and architecture from Fauvism to the present day.
342. **Elementary School Art (5).** Lec. 2, Lab. 9. Pr., junior standing.
Background of design elements, theory of teaching art, methods and materials especially related to elementary school art. Development of creative thinking in elementary school teachers.
355. **Illustration I (5).** Lec. 2, Lab. 9. Pr., AT 182, 215, 222 and 224.
Basic problems in illustration emphasizing both aesthetic and functional aspects. Drawings and designs for line and halftone reproductions.
361. **Fashion I (5).** Lec. 2, Lab. 9. Pr., AT 182 and 215.
Drawing the fashion figure, employing basic types of rendering used in fashion advertising.
381. **Visual Design I (5).** Lec. 2, Lab. 9. Pr., AT 182, 211, 212, 215 and 1.00 grade point averages.
Fundamentals of graphic design. Basic type faces. The trademark. Preparation of art copy for reproduction. Applied problems in advertising and editorial layout.
382. **Visual Design II (5).** Lec. 2, Lab. 9. Pr., AT 381.
Type studies, problems combining copy-fitting with basic illustration. Preparation of color-separation art copy. Creative expression with letter forms. Letterpress and photo-offset production. The poster. Packaging graphics.
383. **Visual Design III (5).** Lec. 2, Lab. 9. Pr., AT 382 and 355.
Script lettering. Planned photographic illustration. Creative design as communication. The trade name. Silkscreen production. Research in pertinent art movements. Packaging graphics.
405. **Printmaking II (5).** Lec. 2, Lab. 9. Pr., AT 106, 182 and junior standing.
Intaglio print media. Etching, engraving and related techniques.
406. **Printmaking III (5).** Lec. 2, Lab. 9. Pr., AT 215, 182 and junior standing.
Stone and metal plate lithography.
407. **Printmaking IV (5).** Lec. 2, Lab. 9. Pr., AT 106, 182 and junior standing.
Serigraphy. Methods and techniques of silkscreen printing.
408. **Printmaking V (5).** Lec. 2, Lab. 9. Pr., either AT 305, 405, 406 or 407 and junior standing.
Advanced work in either relief, intaglio, planographic or serigraphic printmaking.
422. **Painting V (5).** Lec. 2, Lab. 9. Pr., AT 324 and junior standing.
Painting with optional media and subject matter.
423. **Painting VI (5).** Lec. 2, Lab. 9. Pr., AT 422 and junior standing.
Fundamental problems of painting figures. Experimenting with various means of interpreting the figure in both abstract and realistic compositions.
427. **Sculpture III (5).** Lec. 2, Lab. 9. Pr., TS 112, AT 227 and junior standing.
Three dimensional expression. Metal and metal techniques emphasized.
428. **Sculpture IV (5).** Lec. 2, Lab. 9. Pr., AT 427, and junior standing.
Advanced three-dimensional expression.

431. **Contemporary Art (3). General Elective. Pr., junior standing.**
A survey of modern painting, sculpture and visual design. Illustrated lectures, readings.
- 432-433. **Seminar in Art Problems (5-5). Pr., senior standing.**
Open to students who have shown ability, initiative, and industry in carrying out individual projects. Research on approved historical topics or art problems under supervision.
434. **Independent study in Art History (1-10). Pr., senior standing.**
Open to students who have shown ability, initiative, and industry in carrying out individual projects. Research, drawings and reports on historical topics under supervision. May be repeated for maximum of 10 hours.
442. **Art in Education (5). Lec. 3, Lab. 6. Pr., senior standing.**
Lectures, reading and research concerning principles and objectives of pertinent phases of Art for the purpose of understanding their significance in teaching at all levels. Emphasis is placed upon creativity rather than technical skill in laboratory experimentation.
456. **Illustration II (5). Lec. 2, Lab. 9. Pr., AT 355.**
Sustained problems in illustration emphasizing both subjective and objective treatments.
462. **Fashion II (5). Lec. 2, Lab. 9. Pr., AT 361.**
Problems in advanced rendering for fashion advertising: figured and textured fabrics, furs. Newspaper layouts incorporating above textures.
463. **Fashion III (5). Lec. 2, Lab. 9. Pr., AT 462.**
Problems in coordinated fashion merchandising including display cards, newspaper, and magazine advertisements.
481. **Visual Design IV (5). Lec. 2, Lab. 9. Pr., AT 383.**
Original student alphabet with application. Research in pertinent art movements. The brochure. Newspaper layout. Television project. Three-dimensional display.
482. **Visual Design V (5). Lec. 2, Lab. 9. Pr., AT 481.**
Optional problems in graphic design used to extend or improve student portfolios.
496. **Thesis. Pr., senior standing and faculty consent.**
A terminal project initiated by the student and accompanied by a written analysis and evaluation. Both problems and written matter will be defended orally by the student before a faculty group.

GRADUATE COURSES

- 605-606-607-608-609-610-611-612. **Graduate Design (5-5-5-5-5-5-5-5).**
Lab. 15-15-15-15-15-15-15-15.
Advanced programs of creative design in the student's elected field.
- 641-642-643-644. **Graduate Research in Art Problems I-II-III (5-5-5-5).**
Research on approved topics in the student's special field. Conferences and reports.
- 651-652-653. **Graduate Internship in Studio Practice (5-5-5).**
Supervised projects or studio experience in areas of painting, printmaking, sculpture or visual design.
699. **Research and Thesis. Credit to be arranged. All quarters.**
A major art problem consisting of a sustained single project or a logical sequence of shorter projects. The candidate will be required to conceive and execute a work or works exhibiting pronounced creative ability and technical proficiency. Upon recommendation of the major professor, a written essay may be required to accompany the project.

Aviation Management (AM)

Professor Pitts, *Head*

Associate Professors Decker, Fradenburg, and Kiteley

Assistant Professor Callan

201. **Elementary Aeronautics (5).**
Aviation and the basic principles of flight. This course is open to students in all divisions of the University who desire a general and practical knowledge of aviation.
202. **Aerospace History (3).**
Significant events and accomplishments in man's attempts to move through air and space. Emphasis is placed on activities during the twentieth century.
206. **Principles of Private Flight (5). Lec. 5.**
General introduction to flight and preparation for the FAA private pilot written examination. Topics of theory of flight, aircraft and engines, regulation, navigation, meteorology, and aircraft operation and performance covered.
207. **Private Pilot Flight Training (1). Lab. 3. Coreq., AM 206 or instructor's consent.**
Dual and solo flight instruction and discussion to prepare for FAA Private Pilot Certificate. Special Fee.
304. **Meteorology (5). Lec. 4, Lab 3. Pr., sophomore standing.**
Elementary meteorology including a basic understanding of the atmosphere, measurement of meteorological elements and effects of these on the lower atmosphere. Not open to students requiring AM 305.

- 305. Aviation Meteorology (5).** Lec. 4, Lab. 3. Pr., PS 206.
Basic meteorology and its application to aviation to include computation of data and preparation of weather maps. Weather elements as related to operation of aircraft, computation of data; preparation of weather maps.
- 307. Flight Navigation (3).** Lec. 2, Lab. 3. Pr., AM 206 or instructor's consent.
The principles of pilotage, dead reckoning, and radio/electronic methods of navigation and related topics as applied to cross-country flight planning. Credit not permitted for students who have completed AM 312. Offered winter quarter only.
- 308. Federal Aviation Regulations (3).** Pr., sophomore standing.
All regulations concerning airmen, aircraft, air agencies, operation and traffic rules.
- 311. Propulsion Fundamentals (5).** Pr., PS 206.
Principles of operation, major components and important features of typical propulsion systems used in aircraft and missiles. Includes an introduction to propulsion systems used for spacecraft.
- 312. Guidance and Control Fundamentals (5).** Pr., PS 206.
Basic principles of aircraft and spacecraft guidance and control. Credit not permitted for students who have completed AM 307.
- 316. Aircraft Operation and Performance (3).** Lec. 2, Lab. 3. Pr., AM 206 or instructor's consent.
Principles of aircraft performance and operations, including powerplants, aircraft systems and equipment, and advanced flight maneuvers required for commercial pilots. Offered Spring Quarter only.
- 317. Commercial Flight Training I (1).** Lab. 3. Coreq., AM 316 or instructor's consent.
Continuation of flight training toward a Commercial Pilot Certificate with emphasis on the development of precision and accuracy in all intermediate and advanced flight maneuvers. Special Fee.
- 318. Commercial Flight Training II (1).** Lab. 3. Pr., AM 317. Coreq., AM 307 or instructor's consent.
Continuation of flight training toward a Commercial Pilot Certificate with emphasis on cross-country, night and instrument flying. Special Fee.
- 319. Commercial Flight Problems (3).** Lec. 2, Lab. 3. Pr., AM 307 or instructor's consent.
Review of principles of flight, aircraft and engine theory and operation, FAA regulations, navigation, meteorology and aircraft performance and operation as applied to commercial flying with emphasis on preparation for the FAA commercial written examination. Offered Winter Quarter only.
- 320. Commercial Flight Training III (1).** Lab. 3. Pr., AM 318. Coreq., AM 319 or instructor's consent.
Conclusion of flight training for the Commercial Pilot Certificate with training in transition to complex aircraft. A continuation of instrument and night instruction and a review of all maneuvers for the commercial flight test. Special Fee.
- 401. Aeronautical Seminar I (1).** Pr., junior standing.
Special problems and current status of the aircraft and related industries.
- 402. Aerospace Vehicle Systems (5).** Pr., PS 206.
Design, use and function of typical hydraulic, mechanical and electrical systems used on aircraft and missiles. Includes an introduction to some of the major systems used in space vehicles.
- 405. General Aviation Management and Operations (5).** Lec. 4, Lab. 3. Pr., junior standing.
Current principles and practices in management of commercial aviation operations including organization, functions, sources of revenue, operation and typical problems. Laboratory assignments are provided through the School of Aviation. Offered winter and spring quarters.
- 407. Air Transportation (5).** Pr., AM 202, MT 472.
The political, economic, military, social and environmental significance of air transportation; development and present status of mail, cargo, passenger, general aviation transportation and airports; relationship to other types of transportation regarding rates, time, insurance, security and packaging.
- 409. Aerospace Legislation (3).** Pr., AM 407.
The process of enacting legislation; the current Federal statutes pertaining to aerospace and the regulatory agencies established by those statutes. The control and regulation of aerospace activities by state and local governments and a study of typical organizations and actions taken by these agencies, including zoning and airspace easements. International control of air transportation, the agreements and regulatory bodies exercising such control. Includes case studies of application of responsibilities by organizations at all levels.

416. **Airport Management (5). Pr., junior standing.**
The role of the airport manager; airport planning; the National Airport System Plan; airport financing; sources of revenue; liability and insurance; community relations and environment; regulatory functions; current problems.
417. **Airline Operations (5). Pr., AM 409 or Instructor's Consent.**
Airline organizational theory and managerial practices; financial structure and sources of capital; sales and reservations; dispatching and flight operations; equipment selection and aircraft scheduling; personnel relations; research; public relations.
419. **Air Traffic Control (5). Lec. 4, Lab. 3. Pr., junior standing and AM 307 or AM 312.**
All facilities used in controlling air traffic with special emphasis on control center and control tower operation.
421. **Principles of Instrument Flight (3). Lec. 2, Lab. 3. Pr., AM 319 or instructor's consent.**
Instruments, FAA regulations, air traffic control procedures, radio navigation, meteorology, and aircraft operation and performance as applied to instrument flying preparation for the FAA Instrument Pilot Written Examination. Offered Spring Quarter only.
422. **Instrument Flight Training (1). Lab. 3. Pr., AM 320 or instructor's consent.**
Flight and flight simulation instructions in the techniques of instrument flying in preparation for the FAA Instrument Pilot Rating. Special Fee.
427. **Multi-Engine Training I (1). Lab. 3. Pr., a valid Private or Commercial Pilot Certificate.**
Instruction in the methods and techniques of multi-engine aircraft pilotage. Sufficient ground and flight instruction is given to qualify for the FAA pilot rating of Multi-Engine-Land. Special Fee.
428. **Principles of Flight Instruction (3). Pr., AM 320.**
A study of the principles of teaching as applied to instructing, analyzing, and evaluating flight students with emphasis on preparation for the FAA Flight Instructor's Written Examination. Offered Fall Quarter only.
429. **Flight Instructor Training (1). Lab. 3. Coreq., AM 428 or instructor's consent.**
Discussion, instruction, and arranged practice in flight instruction in preparation for the FAA Flight Instructor Certificate.
431. **Multi-Engine Flight Training II (1). Lab. 3. Pr., AM 427, AM 422.**
Instrument and night operations to develop comprehensive flight proficiency in multi-engine aircraft. Experience as copilot/observer in air transportation operations may be included. Special fee.
433. **Transport Aircraft Flight Training (3). Lec. 2, Lab. 3. Pr., AM 431.**
Design, performance and operation of typical transport aircraft. Includes dual instruction and group discussion. Experience as copilot/observer in air transportation operations may be included. Special fee.

Biology (BI)

Coordinator and Assistant Professor Mason

For other staff and biology courses, see sections for Botany and Plant Pathology below and Zoology-Entomology.

101. **Principles of Biology (5). Lec. 4, Lab. 2.**
All quarters. Integrated principles of biology, emphasizing structure and function of cells, reproduction, heredity, ecology, and evolution.
102. **Plant Biology (5). Lec. 4, Lab. 3. Pr., BI 101.**
All quarters. The morphology, physiology, relationships, distribution, and importance of plants.—Credit will not be allowed for both BI 102 and 104.
103. **Animal Biology (5). Lec. 4, Lab. 3. Pr., BI 101.**
All quarters. The morphology, physiology, relationships, distribution, and importance of animals.—Credit will not be allowed for both BI 103 and 104.
104. **Biology in Human Affairs (5). Lec. 5. Pr., BI 101.**
All quarters. Application of biological principles to an understanding of man as an organism and as a member of an ecosystem.—Credit for BI 102, BI 103, ZY 208, and most biology courses above the introductory level will exclude credit for BI 104.

Botany and Microbiology (BY)

Professors Lyle, Head, Curl, D. Davis, N. Davis, Diener,
Gudauskas, Marshall, and Patterson
Associate Professors Carter, Cody, Rodriguez, Truelove, and Williams
Assistant Professors T. Davis, Freeman, Goslin, Klepper, Latham,
Peterson, Shands, and Wilt
Instructor Benson

With few exceptions Principals of Biology, BI 101 and Plant Biology, BI 102, are prerequisite to all courses in this department. For a description of these and other general biology courses see the section for Biology (above).

220. **Introductory Microbiology (5).** Lec. 3, Lab. 4. Fall, Winter, and Summer.
Elementary microbiology as applied to foods, industry, and home sanitation. Credit in any other General Microbiology course precludes credit in this course.
300. **General Microbiology I (5).** Lec. 3, Lab. 4. All quarters. Pr., BI 101, desirable antecedent organic chemistry.
Fundamentals of microbiology including history of microbiology, cell structure, chemical composition, growth, nutrition, metabolism, genetics, classification, cultivation, and distribution of bacteria, viruses, rickettsia, and fungi; also a discussion of the effects of chemical and physical agents on the growth of microorganisms.
301. **General Microbiology II (5).** Lec. 3, Lab. 4. Pr., BY 300.
Emphasis is placed on the interactions between microbial populations, interactions of microorganisms with macroorganisms, microbial eco-systems, microbes as geochemical agents, and the effects of microorganisms on human society. Intended especially for students who wish to major in microbiology.
302. **Medical Microbiology (5).** Lec. 3, Lab. 4. Fall, Spring, Summer. Pr., BY 300 or equivalent.
Etiology, epidemiology, immunity, identification and pathogenesis of microorganisms of medical importance to man.
303. **Microbial Taxonomy (5).** Lec. 3, Lab. 4. Winter. Pr., BY 300.
International Code of Nomenclature of bacteria and viruses. The development of microbiological literacy; classification of taxa based on phylogeny, molecular and numerical concepts.
306. **Fundamentals of Plant Physiology (5).** Lec. 3, Lab. 4. Pr., BI 102, CH 203 or 207 or equivalent.
General aspects of fundamental life processes of plants involving physiological, structural, and environmental relationships.
308. **Economic Botany (3).** Lec. 3. Pr., BI 102 or 104 or equivalent.
The part played by man in the modification and distribution of plants, and the role of plants in human economy and technology as food, fiber, timber, forage, drugs, etc.
309. **General Plant Pathology (5).** Lec. 3, Lab. 4. Winter, Spring. Pr., BI 101-2.
Nature cause, and control of plant diseases illustrated by studies of the more common diseases of cultivated crops.
310. **Forest Pathology (3).** Lec. 1, Lab. 4. Winter, Spring. Pr., BI 101-2 or equivalent.
Diseases of forest and ornamental trees from seedling to maturity including cause, identification, prevention, and control; decay in timber and forest products. Field trips emphasize major tree diseases in Alabama.
401. **Biological Statistics (5).** Lec. 4, Lab. 2. Fall, Spring. Pr., MH 161, and junior standing.
Basic concepts of experimental statistics, distributions, confidence limits, tests of significance, analysis of variance, linear correlation and regression. For advanced undergraduates and as a beginning course for graduate students in biological sciences.
405. **Introductory Mycology (5).** Lec. 2, Lab. 6. Fall. Pr., BI 101-2 or equivalent and junior standing.
A systematic survey of the fungi with emphasis on morphology.
406. **Systematic Botany (5).** Lec. 3, Lab. 4. Spring, Summer, and Fall. Pr., BI 101-2 or equivalent and junior standing.
Identification, classification, nomenclature, distribution and systematic relationship of the seed-bearing plants, utilizing primarily elements of the local flora as study material. The historical background, literature of plant taxonomy, and rules of nomenclature will be considered. Field trips will be made.
409. **Marine Botany (6).** Lec. 5, Lab. 12. Summer. Pr., Ten hours of biology, including introductory botany, or consent of instructor.
Survey, based upon local examples, of the principal groups of marine algae and maritime flowering plants, involving their structure, reproduction, distribution, identification, and ecology. Restricted to participants in the Gulf Coast Research Laboratory Teaching Session.
410. **Aquatic Plants (5).** Lec. 3, Lab. 4. Summer. Pr., BI 101-2 or equivalent and junior standing.
Identification and study of those plants found in or associated with the fresh water features of Alabama. Emphasis will be on plants which have particular relationships to wildlife management or fish culture. Field trips will be taken and a plant collection required.
411. **Phycology (5).** Lec. 2, Lab. 6. Spring. Pr., BI 101-2 or equivalent and junior standing.
The identification, growth, reproduction, distribution, evolution and economic importance of the algae. Field trips will be made.

412. **Advanced Plant Pathology I (5).** Lec. 2, Lab. 6. Spring, odd years. Pr., BY 309 or equivalent and junior standing.
Techniques and methodology used in the study of plant pathogens, particularly fungi, bacteria, viruses, and nematodes, and the diseases they cause.
413. **General Plant Ecology (5).** Lec. 3, Lab. 4. Fall and Spring. Pr., BY 306 and junior standing.
Natural vegetation, environment, and interrelationships between the two with primary emphasis on the Southeastern United States. Field trips will be made.
414. **Morphology of the Vascular Plants (5).** Lec. 3, Lab. 4. Spring. Pr., BI 101-2 or equivalent and junior standing.
Comparative morphology of the principal groups of vascular plants concerning their structure, development, reproduction, and evolutionary relationships. Field trips will be made.
415. **Developmental Plant Anatomy (5).** Lec. 3, Lab. 4. Winter. Pr., BI 101-2 or equivalent and junior standing.
Comparative anatomy of vascular plants with emphasis on structural and developmental relationships. A review of current anatomical, experimental, and ultra-structural research in plant anatomy.
416. **Biological Microscopy, Microtechnique, and Photography (5).** Lec. 2, Lab. 6. Fall. Pr., permission of instructor.
Various methods of tissue preparation for observation with the light microscope, including fixing, paraffin and plastic embedding, sectioning, general and cyto-chemical staining and mounting. Smear and squash techniques. Introduction to optical microscopy, macro- and microphotography. Techniques of developing, printing, enlarging, and copying for photographic illustration and lantern slide presentation.
419. **Principles in Plant Disease Control (3).** Lec. 2, Lab. 2. Spring, even years. Pr., BY 309 and junior standing.
Designed to acquaint the student with such principles of plant disease control as protection, exclusion, eradication, and resistance. The control of important plant pathogens will be considered by each method. Emphasis will be placed on chemical control with antibiotics, fumigants, and fungicides.
430. **Plant Nematology (5).** Lec. 2, Lab. 6. Winter, even years. Pr., BY 309, BI 101 or permission of instructor and junior standing.
Various roles of nematodes in relation to plant diseases caused by the nematodes and other pathogens. Identification of the plant-nematodes nature of pathogenicity; principles and practices of control; recent advances in phytonematology.
440. **Microbial Physiology (5).** Lec. 3, Lab. 4. Spring. Pr., BY 300, CH 203 or 207 and junior standing.
Cellular structure, function, nutritional requirements, energy metabolism, growth cycles, active transport mechanisms, biosynthesis, and mutation and genetics.
441. **Sanitary Microbiology (5).** Lec. 3, Lab. 4. Winter quarter. Pr., BY 300 and junior standing.
Theory and application of fundamental principles of microbiology, ecology and biochemistry of microorganisms in water and sewage.
442. **General Virology (5).** Lec. 3, Lab. 4. Fall. Pr., BY 300, BY 302 or equivalent and junior standing.
The molecular biology of bacterial, plant and animal viruses and rickettsiae; pathogenesis and methods of diagnosis, isolation, cultivation and purification procedure.
443. **Immunology and Serology (5).** Lec. 2, Lab. 6. Summer. Pr., BY 300 or 302 and junior standing.
Concepts pertaining to post immunity, antigen-antibody reactions, cytotoxicity, hemagglutination, complement-fixation, and hypersensitivity; emphasis in laboratory will be placed on demonstrating these phenomena by serological techniques.
460. **Special Problems (1-3).** All quarters. Pr., senior standing and consent of instructor.
A. Anatomy; B. Ecology; C. Morphology; D. Pathology; E. Physiology; F. Taxonomy. A student cannot register for more than 3 hours credit.

GRADUATES ONLY, MAJOR OR MINOR

601. **Biological Statistics II (5).** Lec. 4, Lab. 2. Winter. Pr., BY 401 or equivalent.
Analysis of variance, randomized block, Latin square and split plot designs, factorials, analysis of covariance, and multiple regression.
602. **Least Squares Analysis of Experiments (5).** Lec. 4, Lab. 2. Spring, even years. Pr., BY 401 and BY 601 or equivalent.
Analysis and interpretation of experimental data by least squares procedures; general linear models and hypotheses; weighted regression; irregular two-factor design.
604. **Advanced Plant Physiology I (5).** Lec. 3, Lab. 4. Fall. Pr., BY 306 and 10 hours of organic chemistry.
Molecular biology and plant metabolism; a correlation of the fine structures of the cell with metabolic pathways occurring therein.

605. **Advanced Plant Physiology II (5).** Lec. 3, Lab. 4. Winter. Pr., BY 604 or equivalent.
Water relations and mineral nutrition. Internal and external factors affecting the absorption, translocation, utilization, and loss of water and mineral elements by green plants.
606. **Advanced Plant Physiology III (5).** Lec. 3, Lab. 4. Spring. Pr., BY 604 or equivalent.
Plant growth. A review of literature and laboratory methodology of plant physiological subject matter in the areas of plant growth regulators, mode of action of growth regulators, and factors affecting plant growth.
608. **Advanced Systematic Botany (5).** Lec. 2, Lab. 6. Fall. Pr., BY 406.
Experimental and research aspects of the taxonomy of vascular plants. The literature, techniques and methodology relative to the identification and biosystematic classification of evolutionary units; intensive study of special groups of plants and the application of resultant data to specific taxonomic problems.
609. **Advanced Mycology (5).** Lec. 2, Lab. 6. Spring, odd years. Pr., 405 and consent of instructor.
Identification and classification of fungi. Field trips will be made.
610. **Microbial Cytology and Genetics (5).** Lec. 2, Lab. 6. Fall. Pr., BY 310, or 302, CH 418.
Molecular biology of microbial cells, inheritance, genetic-transfer mechanisms, sexuality and mutation.
611. **Ecology of Soil Fungi (5).** Lec. 2, Lab. 6. Spring, even years. Pr., BY 309 or equivalent, BY 405.
Quantitative and qualitative consideration of the microbial population of the soil. Relation of physical environment, antagonistic microorganisms, and higher plants on growth and survival of soil fungi. Emphasis will be on methodology for studying soil microflora and plant disease relationships.
612. **Physiology of Plant Pathogenic Fungi (5).** Lec. 3, Lab. 4. Winter, odd years. Pr., 10 hours of microbiology and 5 hours of biochemistry.
Biochemical activities of fungi as related to their nutrition, growth, reproduction and fermentative abilities.
613. **Determinative Bacteriology (5).** Lec. 2, Lab. 6. Summer. Pr., BY 301, 303.
Isolation, purification, and identification of bacteria; experimental application of international rules of nomenclature.
614. **Plant Ecosystems (5).** Lec. 3, Lab. 4. Summer, even years. Pr., BY 413.
Plant ecosystems and the effects of current technology on these systems. Problems relating to pollution and maintaining a quality environment will be covered.
615. **Developmental Morphology of the Angiosperms (5).** Lec. 3, Lab. 4. Fall, even years. Pr., BY 414.
Principles of angiosperm reproduction with emphasis on structural and developmental relationships. A review of the literature associated with anatomical, experimental, and ultrastructural aspects of angiosperm reproduction.
616. **Cytology and Cytogenetics (5).** Lec. 3, Lab. 4. Winter. Pr., ZY 300.
Cell structure and function with emphasis on cell reproduction and factors contributing to the evolution of organisms.
617. **Phytovirology (5).** Lec. 3, Lab. 4. Winter, odd years. Pr., BY 309 or 310, VM 495.
To acquaint students with viruses as plant pathogens and the diagnosis and control of diseases caused by them. Laboratory will involve methodology in the transmission, isolation, and characterization of viruses which infect plants.
618. **Clinical Plant Pathology (5).** Lec. and Lab. 8. Summer, even years. Pr., BY 412 or equivalent or consent of instructor.
Identification, epidemiology, etiology, and control of the major diseases on various kinds of economic plants, to be selected on the basis of current needs of the students.
619. **Advanced Plant Pathology II (5).** Lec. 3, Lab. 4. Summer, odd years. Pr., BY 309 or equivalent.
Biological significance of etiology, epiphytology, and host-parasite relations in plant diseases. Classical and current theory will be considered in relation to concepts and problems in plant pathology.
620. **Chemical Weed Control (5).** Lec. 3, Lab. 4. Summer, odd years. Pr., BY 306, BY 406, or AY 414.
Application, mode of action, physiological relationships, recent advances, and special weed problems.
621. **Industrial and Applied Microbiology (5).** Lec. 3, Lab. 4. Winter, even years. Pr., 10 hours of microbiology and 5 hours of biochemistry.
Quantitative and qualitative study of the actual and potential uses of microorganisms in industry and human affairs.
625. **Special Problems. Credit to be arranged.**
A. Cytology; B. Ecology; C. Morphology; D. Mycology; E. Nematology; F. Pathology; G. Physiology; H. Taxonomy; I. Chemical Weed Control; J. Marine Botany; K. General Biology Teaching; L. Virology.

635. **Biological Processes (5). Lec. 5. Summer. Pr., BI 101-2, CH 104, teaching experience and graduate standing.**
Acquaints teachers of biology with the principal life-processes of cells, such as photosynthesis, respiration and assimilation, and the organelles within which these proceed.
636. **Microbiology (5). Lec. 3, Lab. 4. Summer. Pr., teaching experience.**
Structure and activities of microorganisms, their distribution and cultivation. The algae, fungi, bacteria, and protozoa are considered particularly as they relate to animal and plant disease, food, industrial uses, sanitation, and immunization.
640. **Department Forum (1). Fall, Winter and Spring. Required of all majors, open to all minors.**
Discussions concerning current topics in the various sciences and related fields.
641. **Seminar in Plant Physiology (1). Fall, Winter, and Spring. May be taken more than once for credit.**
650. **Nuclear Science in Agriculture (5). Lec. 3, Lab. 4. Spring. Pr., graduate standing with research experience.**
Role of nuclear science in agricultural research with training in the use of radioisotopes and familiarization with the possibilities, limitations, and necessary safety precautions.
699. **Research and Thesis. Credit to be arranged. May be taken more than one quarter.**
799. **Doctoral Research and Dissertation. Credit to be arranged.**

Building Technology (BT)

Professor Brandt, *Head*

Associate Professors Darden, Shuttleworth, and Timberlake

Assistant Professor Housholder

Instructor Fretwell

101. **Introduction to Building (3). Lab. 9.**
Survey of the building industry; building procedures; study of plans and details; use of drawing tools; elements of estimating. Lectures, readings, drawings.
102. **Drawing and Projections (3). Lab. 9.**
Application of geometry to orthographic, isometric, cavalier, cabinet, and perspective projections. Exercises in working drawings.
206. **Materials and Construction (5). Pr., BT 101 or consent of instructor.**
Structural and finish materials and assembly systems used in buildings. Lectures, reports, readings, drawings.
220. **Introduction to Structures (3). Pr., MH 162.**
The basic concepts of building structures. Typical solution methods to building problems, cross sectional properties. Lectures, problems.
221. **Mechanics of Structures (5). Pr., BT 220, PS 205.**
Principles of mechanics as applied to building construction, graphic statics; resolution of external forces; analysis of trusses; friction. Lectures, problems.
- 311-12-13. **Structures I-II-III (3-3-3). Pr., BT 221.**
Statically determinate structures including beams, columns, trusses, struts, and tension members. Shear and bending moments, torsion, slope and deflection. Problems worked in wood, reinforced concrete, steel and other structural materials. Lectures, research and problems.
321. **Construction Problems I (5). Pr., BT 221.**
Detailed estimating; construction planning, practices, and equipment; manpower allocation. All of preceding pertaining to earthwork, concrete, steel, and masonry construction. Lectures, problems.
322. **Construction Problems II (5). Pr., BT 312 and 321.**
Formwork design, concrete mixes, use of standardized construction components, dimensional controls. Lectures, problems.
- 361-62-63-64. **History of Building I-II-III-IV (3-3-3-3). Pr., BT 206.**
An analysis of the development and use of construction methods and materials showing the effects of this development on building form from ancient to contemporary times. Illustrated lectures, readings, reports and drawings.
- 411-12. **Structures IV-V (3-3). Pr., BT 313.**
Continuation of Structures I-II-III in the field of statically indeterminate structures. Consideration of lateral stability in buildings. Design of foundations. Lecture, research and problems.
413. **Structures VI (5). Pr., BT 412.**
Applied principles of all material presented in BT 220-1, 311-13, and 411-12. Lectures, problems.
- 414-15-16. **Advanced Structures I-II-III (5-5-5). Pr., BT 413.**
Theory and practical design of complex and long span structures, both in steel and reinforced concrete. Multiple story buildings, towers, arches, vaults, domes, thin shell systems, foundations. Lectures, research and problems.

433. **Construction Methods and Estimating I (5).** Pr., BT 321 or consent of instructor. The complete quantity survey and pricing; the builder's organization, office procedures and records; construction bonds, insurance, contracts, and financing. Preparation of bid from working drawings. Lectures, problems.
434. **Construction Methods and Estimating II. (5).** Pr., BT 321. Construction practices in relation to management control techniques for planning, scheduling, cost control and forecasting, manpower leveling and allocation. Critical path method, scheduling and applications of precedence diagrams. Lectures, problems.
- 452-53. **Building Equipment I-II (3-3).** Pr., PS 206. Description and analysis of heating, air conditioning, water supply, plumbing, electrical wiring, motors, elevators, and illumination as related to buildings. Lectures, demonstrations, readings, problems.
454. **Building Equipment III (2).** Lab. 6. Pr., BT 453. A continuation of Building Equipment I and II in selected laboratory problems.
460. **Special Problems (Credit 1-5).** Pr., Department Head approval, junior standing. Development of an area of concentration through independent study under staff supervision.
490. **Building Construction Thesis (7).** Lecture 2, Lab. 15. Pr., final quarter prior to graduation. Special study or detailed Cost Analysis and Construction Program for a building (each as approved by the Faculty Thesis Committee). Cost Analysis and Bid to include all documents required by the Contract and/or necessary to construct the project. Candidate will defend thesis orally before staff and guest specialists.

Chemical Engineering (CHE)

Professors Hsu and Wingard

Associate Professors Taylor, Head, Hirth, and Vives

Assistant Professors Askew and Guin

101. **Chemical Engineering Fundamentals (1).** A workshop and orientation in the use of the slide rule, graphs, interconversion of units, and chemical engineering practice.
213. **Digital Computers (2).** Lec. 1, Lab. 3. Workshop on digital computer programming in the area of chemical engineering.
310. **Process Economics (3).** Pr., junior standing. The economic factors affecting the design, operations, and economic aspects of industrial chemical processing, including cost estimation and feasibility studies.
313. **Chemical Engineering Analysis (4).** Pr., MH 265. Application of mathematical principles and techniques to the analysis and solution of typical chemical engineering problems.
320. **Analog Computation (3).** Pr., MH 265, EE 262. The basic principles of analog computer theory and programming applications to chemical engineering. Includes time and amplitude scaling.
321. **Chemical Process Principles I (4).** Pr., CH 115, PS 220, Coreq., CHE 331. Application of mass balance and stoichiometry to chemical processes and plants.
322. **Chemical Process Principles II (4).** Pr., CHE 321. Application of total energy balance to flow and non-flow processes with emphasis on enthalpy balances and thermochemistry. Detailed treatment of combined mass and enthalpy balances.
331. **Engineering Thermodynamics (3).** Pr., MH 264, PS 220. Application of thermodynamic laws and principles to engineering.
343. **Stagewise Processes (4).** Coreq., CHE 353. Theory and design methods of stagewise processes to include analytical, graphical and computer-oriented finite difference methods in such processes as extraction, leaching and distillation.
352. **Fluid Mechanics (4).** Pr., CHE 331 or ME 301. Includes conservation equations, momentum transfer in laminar flow, turbulence, dimensional analysis, design calculations for conduits, packed beds, fluidized systems and filtration.
353. **Thermal Transfer (4).** Pr., CHE 352. Includes heat conduction, heat transfer in laminar flow, turbulent heat transfer, analogy between heat and momentum transfer, boiling and condensing vapor, design calculations on heat transfer equipment and evaporation.
411. **Process Dynamics and Control (5).** Lec. 3, Lab. 6. Pr., CHE 313 and senior standing. Dynamic analysis of chemical processes. Principles of closed loop feedback control theory, stability, root locus, and frequency response. Use of analog computer for process simulation and mathematical modeling.

421. **Chemical Engineering Thermodynamics (4).** Pr., CHE 322 and junior standing. Thermodynamics of phase and chemical equilibrium. Introduction to the statistical thermodynamics of perfect gases.
422. **Applied Chemical Kinetics (4).** Pr., CHE 421 and junior standing. Rates of reactions of various orders and complex reactions in respect to the design of chemical reactors. Considered also are catalytic reaction mechanisms and transfer of mass and heat affecting reactor design and operations.
440. **Nuclear Engineering (5).** Pr., PS 305 or PS 320, MH 265 or COI and junior standing. Atomic physics and nuclear reactions. Nuclear reactor principles, design, and engineering, including radiation, shielding, instrumentation, and heat transfer.
442. **Chemical Engineering Design I (4).** Coreq., CHE 422 and senior standing. Individual or group design projects relating to chemical engineering practice.
443. **Chemical Engineering Design II (6).** Pr., CHE 442 and senior standing.
450. **Special Topics in Chemical Engineering (Credit to be arranged with a maximum of 10 hours).** Directed reading covering items of chemical engineering theory in depth coupled with individual laboratory work. May be taken more than once.
451. **Mass Transfer (4).** Pr., CHE 353 and junior standing. Laminar and turbulent mass transfer, gas absorption, humidification and distillation.
460. **Introduction to Plastics (3).** Pr., CH 304 or consent of instructor, junior standing. High polymers. Includes the chemistry, technology and uses of cellulose, phenolics and amino plastics, polyolefins, vinyls, styrene, acrylics, polyesters, epoxies, polyamides, polyurethanes, silicones and rubbers.
465. **Industrial Waste Water Treatment (4).** Lec. 3, Lab. 3, Pr., CHE 352, ME 340, or CE 308, and junior standing. Introduction to chemical treatment methods for industrial waste water pollutants. Identification and analysis of major industrial waste water pollutants. Design and cost considerations in chemical process treatment equipment.
470. **Seminar (1).** Senior standing. May be taken for credit twice.
475. **Rate Processes in Materials (3).** Pr., CH 408 or permission of instructor, and junior standing. Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials.
482. **Chemical Engineering Laboratory (6).** Lec. 3, Lab. 9, Pr., CHE 451 junior standing. Laboratory work in chemical engineering processes.
485. **Air Quality Engineering (4).** Lec. 3, Lab. 3, Pr., CHE 331 or ME 301 junior standing. Sources and chemical nature of gaseous pollutants. Principles of mass transfer as related to the removal of gas pollutants. Design calculations and engineering of treatment facilities including adsorption and absorption.
495. **Biochemical Engineering (3).** Pr., CH 418, BY 300 and junior standing. Kinetics and reactor design for fermentation processes. Principles of industrial sterilization.

COURSES PRIMARILY FOR GRADUATE STUDENTS

600. **Chemical Engineering Analysis I (3).** Pr., graduate standing. Mathematical analysis of chemical engineering problems to include the formulation of differential equations, analytical and numerical techniques for problem solution, data correlation and analysis, and computer applications.
601. **Chemical Engineering Analysis II (3).** Pr., CN 600. A continuation of CN 600.
610. **Transport Phenomena I (3).** Coreq. CN 600. Principles of momentum, heat and mass transport, laminar systems, equations of motion.
611. **Transport Phenomena II (3).** Pr., CN 610. A continuation of CN 610.
612. **Transport Phenomena III (3).** Pr., CN 611. A continuation of CN 611 with special emphasis on turbulence.
613. **Transport Phenomena IV (3).** Pr., CN 612. A continuation of CN 612.
620. **Chemical Engineering Thermodynamics I (3).** Pr., graduate standing. Properties of real gases and liquids, chemical and phase equilibrium.
621. **Chemical Engineering Thermodynamics II (3).** Pr., CN 620. Phase equilibrium of non-electrolytes.

622. **Engineering Statistical Thermodynamics I (3). Pr., CN 620.**
Fundamentals of statistical mechanics, partition functions, chemical equilibrium.
623. **Engineering Statistical Thermodynamics II (3). Pr., CN 622.**
Applications of molecular theory and models to the properties of real gases and liquids.
625. **Reaction Engineering I (3). Pr., CN 610.**
Analysis and design of chemical reactors.
626. **Reaction Engineering II (3). Pr., CN 625.**
A continuation of CN 625.
630. **Process Dynamics and Control I (3). Coreq., CN 600.**
Advanced linear control system analysis and an introduction to nonlinear systems.
631. **Process Dynamics and Control II (3). Pr., CN 630.**
An introduction to modern control theory with emphasis on chemical reactors and stagewise processes.
632. **Process Modeling and Simulation (3). Pr., CN 600.**
Mathematical modeling of chemical process systems, process simulation with analog computers and digital simulation languages.
633. **Optimization (3). Pr., CN 632.**
Applications of linear and non-linear optimization techniques to chemical process and equipment design, introduction to optimal control.
640. **Distillation (3). Pr., graduate standing or COI.**
Design principles for multicomponent, extractive, azeotropic, and other complex distillation processes.
641. **Absorption and Extraction (3). Pr., graduate standing or COI.**
Design principles for gas absorption and extraction processes.
642. **Heat Transfer (3). Pr., graduate standing or COI.**
Analysis and design principles for advanced heat transfer processes, special emphasis on two phase heat transfer in reaction systems, packed beds, and other process equipment.
645. **Polymer Engineering (3). Pr., graduate standing or COI.**
Structure of polymers, molecular forces and properties, polymer formation and modification, kinetics of polymerization, polymer technology and applications.
646. **Process Economics (3). Pr., graduate standing or COI.**
Venture analysis, project justification, cost estimation, and project engineering.
650. **Special Topics in Chemical Engineering (Credit TBA). Pr., COI, and departmental approval.**
May be taken more than one quarter.
670. **Seminar (1). Pr., graduate standing.**
May be taken up to three quarters for credit.
699. **Research and Thesis. Credit to be arranged.**

Chemistry (CH)

Professors Colburn, *Head*, Baker, Capps, Kosolapoff, Land, Melius, Nichols, Stevens, Ward, and Young
Associate Professors Dinius, Greene, Johnson, Neely, Peterson, and Ziegler
Assistant Professors Friedman, Hargis, Hill, Mountcastle, Perry, Shevlin, and Wheatley

101. **Introductory Chemistry I (2). Lec. 4. Pr. or Coreq., MH 159, MH 160, or MH 161.**
To acquaint science students with the classifications of matter and the manner in which the chemist identifies matter and records the nature of its changes. Atomic structure, chemical bonding, molecular aggregations and the laws summarizing the properties and nature of the physical states of matter are considered.
102. **Introductory Chemistry II (2). Lec. 3. Pr., CH 101, Coreq., CH 103L.**
A continuation of the topics described under CH 101.
103. **Fundamentals of Chemistry I (4). Lec. 4. Pr., high school chemistry, Coreq., MH 160, or MH 161, CH 103L.**
Encompasses the subject matter of CH 101 and 102 for the superior student with adequate background preparation. Assignment of this course is based upon certain placement criteria and departmental approval is required.
- 103L. **General Chemistry Laboratory (1). Lab. 3. Coreq., CH 102 or CH 103.**
The basic laboratory techniques, to experimental measurements, and to the interpretation of data.
104. **Fundamentals of Chemistry II (4). Lec. 4. Pr., CH 103 or CH 102, Coreq., CH 104L.**
A continuation of CH 102 or CH 103. The methods of preparation and the reactions of individual as well as classes of chemical compounds are used to study and illustrate the mechanism and dynamics of chemical change.

- 104L. General Chemistry Laboratory (1). Lab. 3. Pr., CH 103L, Coreq., CH 104.
A continuation of CH 103L.
105. Fundamentals of Chemistry III (4). Lec. 4. Pr., CH 104, Coreq., CH 105L.
Solution chemistry including various ionic equilibria, coordination compounds, acid-base phenomena and redox processes. Quantitative analytical problem-solving will be emphasized.
- 105L. General Chemistry Laboratory (1). Lab. 3. Coreq., CH 105.
A continuation of CH 103L and CH 104L.
111. General Chemistry (5). Lec. 4, Lab. 3. Pr., Coreq., MH 160, or MH 159, or MH 161. Credit in CH 101, 102 or 103 precludes credit for this course.
For chemistry majors and others in closely related areas.
112. General Chemistry (5). Lec. 4, Lab. 3. Pr., CH 111 or CH 103. Credit in CH 104 precludes credit for this course.
Continuation of CH 111.
113. General Chemistry (5). Lec. 4, Lab. 3. Pr., CH 112. Credit in CH 105 and/or 105L precludes credit for this course.
Continuation of CH 112.
201. Descriptive Chemical Science (5). Lec. 5. Pr., MH 159.
To foster in the non-science student an appreciation for the chemical nature of the material universe and the contribution of chemistry to his cultural heritage. This course will not serve as a prerequisite for any other chemistry course.
203. Organic Chemistry (5). Pr., CH 104.
Fundamentals of organic chemistry. Designed for students in Home Economics, and others.
204. Analytical Chemistry (3). Lec. 3. Each quarter. Pr., CH 105 and CH 105L or CH 113.
Theory and application of gravimetric, volumetric, and colorimetric chemical analysis.
- 204L. Analytical Chemistry Laboratory (2). Lab. 8. Each quarter. Pr. or Coreq., CH 204.
Analytical techniques applied to the analysis of ores and minerals.
205. Analytical Chemistry (5). Lec. 3, Lab. 6. Pr., CH 204.
Fundamental concepts used in analytical chemistry and observed in the laboratory via gravimetric analysis and separation techniques.
207. Organic Chemistry (4). Lec. 4. Pr., CH 104.
This course together with CH 208 meets the needs of students in Laboratory Technology, Pre-Medicine, Pre-Dentistry, Pre-Veterinary Medicine, Pre-Pharmacy, and in other biological sciences.
- 207L. Organic Chemistry Laboratory (1). Lab. 3. Pr. or Coreq., CH 207.
208. Organic Chemistry (3). Lec. 3. Pr., CH 207 and CH 207L.
Continuation of CH 207.
- 208L. Organic Chemistry Laboratory (2). Lab. 6. Pr. or Coreq., CH 208.
209. Organic Chemistry (5). Lec. 5. Pr., CH 208.
A continuation of CH 208 with emphasis on the study of those organic compounds considered to be the most important to the understanding of biochemistry; i.e., polyfunctional compounds, carbohydrates, liquids, amino acids, proteins, and heterocyclic compounds.
301. Biochemistry (5). Lec. 4, Lab. 3. Pr., CH 208. Credit in CH 418 precludes credit for this course.
Especially designed for students in Pharmacy.
302. Biochemistry (4). Pr., CH 301. Credit in CH 419 precludes credit for this course.
Continuation of CH 301.
303. Organic Chemistry (5). Lec. 4, Lab. 3. Pr., CH 113.
Organic chemistry covering nomenclature, group reactions, important theories and concepts relating to aliphatic and aromatic compounds, designed primarily for chemistry majors.
304. Organic Chemistry (5). Lec. 3, Lab. 6. Pr., CH 303.
Continuation and extension of CH 303.
305. Organic Chemistry (5). Lec. 3, Lab. 6. Pr., CH 304.
Continuation and extension of CH 303-304, including heterocyclic compounds and many classes of compounds of interest in the field of biochemistry.
316. Physical Chemistry (5). Pr., MH 159 or MH 160, CH 105 and PS 205.
A one-quarter course for pre-medicine students.
401. Chemistry for High School Science Teachers (5). Lec. 4, Lab. 3. Summer. Pr., teaching experience.
404. Organic Analysis (Qualitative) (5). Lec. 3, Lab. 6. Pr., CH 305 or equivalent and junior standing.
After performing identification tests on known compounds, the student identifies pure organic unknowns, and separates and identifies the compounds of mixtures. Graduate students identify more unknowns than required of undergraduates.

407. **Physical Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 104 or CH 112; MH 264; PS 221 or 206; and junior standing.
A discussion of the more important theories and laws of physical chemistry.
408. **Physical Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 407, and junior standing.
Continuation of CH 407.
409. **Physical Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 408 and junior standing.
An extension of principles studied in CH 407-8 with special reference to modern theories of the structure of matter.
410. **Intermediate Inorganic Chemistry I (5).** Lec. 5, Pr., CH 408 and junior standing.
Atomic structures, valence bonding, and periodic properties of the elements.
411. **Intermediate Inorganic Chemistry (5).** Lec. 3, Lab. 6. Pr., CH 410 and junior standing.
Synthesis and purification of typical inorganic compounds.
412. **Chemical Thermodynamics (5).** Pr., CH 408, and junior standing.
Basic laws governing changes in energy in gases, liquids, and solids.
413. **Analytical Chemistry (5).** Lec. 3, Lab. 6. Pr., CH 409, and junior standing.
Fundamental concepts used in instrumental analytical chemistry and as observed in the laboratory via spectrophotometric, electroanalytical, and chromatographic techniques.
415. **Polymer Technology I (4).** Lec. 3, Lab. 3. Pr., CH 304 or CN 460 and junior standing.
Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture.
416. **Polymer Technology II (3).** Lec. 3. Pr., CH 415 or TE 424 and junior standing.
Continuation of CH 415. Study of polymerization and condensation polymers. Modes of fabrication, special use selection requirements, and study of a number of commercially available materials and their areas of use.
- 418-419-420. **Biochemistry (5-5-5).** Lec. 4, Lab. 3. Pr., CH 208, and junior standing.
A standard year-course in the principles of biochemistry.
490. **Special Problem in Chemistry (5).** Lab. 15. Pr., consent of instructor and senior standing. Not open to graduate students.
An individual problem course. Each student will work under the direction of a staff member on some problem of mutual interest.

GRADUATE COURSES

601. **Selected Topics in Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 401 or equivalent.
Modern topics in general chemistry and a short review of organic chemistry.
610. **Advanced Inorganic Chemistry (5).** Pr., CH 410 or equivalent.
Selected groups of inorganic compounds are considered from a modern physicochemical viewpoint; thus emphasizing their chemical and physical properties, their rates of conversion one into another, their molecular structure, and valence relationships.
611. **Advanced Topics in Inorganic Chemistry (5).** Pr., CH 610 or equivalent.
A consideration of the relationship of inorganic chemistry to atomic structure in terms of recent theoretical developments.
612. **Inorganic Preparations (5).** Lab. 15. Pr., CH 610 or CH 611.
The preparation of typical inorganic compounds illustrating special and more advanced techniques.
614. **The Chemistry of Coordination Compounds (5).** Pr., CH 410 or equivalent.
Complex inorganic compounds with emphasis on early and modern developments, isomerism, chelation, and methods of determining formation constants.
616. **Inorganic Reaction Mechanisms (5).** Pr., CH 410 or equivalent.
Factors affecting the rates of inorganic reactions in solution.
620. **Advanced Organic Chemistry I (5).** Lec. 5. Pr., CH 305 or equivalent.
Organic reaction mechanisms, free radicals, carbonium ions, carbanions, carbenes, etc.
621. **Advanced Organic Chemistry II (5).** Lec. 5. Pr., CH 620.
Physical organic chemistry with emphasis on the interpretation of organic reaction mechanisms.
622. **Advanced Organic Chemistry III (5).** Lec. 5. Pr., CH 620.
Current synthetic methods of organic chemistry.
623. **Heterocyclic Compounds (5).** Pr., CH 621 or equivalent.
Organic compounds containing heterocyclic ring systems.
624. **Element-Organic Compounds (5).** Pr., CH 621 or equivalent.
Organic chemistry of Groups III, IV and V elements.
625. **Organic Nitrogen Compounds (5).** Pr., CH 621 or equivalent.
Organic compounds containing nitrogen.

627. **Special Topics in Organic Chemistry (5).** Pr., CH 621 or equivalent.
A selection of modern topics in organic chemistry.
628. **Introduction to Theoretical Organic Chemistry (5).** Pr., CH 621 or equivalent.
Topics generally considered include molecular structure; chemical reactions and energy change; structure-reactivity relationships; dipole moments and carbonium, olefinic and free-radical stability; and organic chemical spectroscopy.
- 630-631. **Advanced Physical Chemistry (5-5).** Pr., CH 409. CH 630 is pr. for CH 631.
Topics generally considered include kinetic theory of matter, modern theories of the structure of matter, generalized thermodynamics, relation of molecular structure to spectroscopic and thermodynamic properties, and kinetics of chemical reactions.
632. **Relation Between Structure and Properties of Chemical Substances (5).** Pr., CH 631.
Established relationships that exist between structures of organic and inorganic compounds and physical properties which are relatively easy to determine. The principal aim is the demonstration of the fundamental relation of structure of compounds and electronic configurations.
633. **Chemical Kinetics (5).** Pr., CH 631.
The mathematics and characterization of chemically reacting systems include discussions of the collision theory, the transition state theory, unimolecular reactions in condensed phases, behavior of nonstationary-state systems, and photochemistry.
634. **Heterogeneous Equilibria (5).** Pr., CH 631.
Chemical and physical equilibria in heterogeneous systems.
636. **Statistical Thermodynamics (5).** Pr., CH 631.
Statistical approach to thermodynamics and chemical equilibrium.
637. **Introduction to Quantum Chemistry (5).** Pr., CH 631.
Quantum theory as applied to chemical problems.
638. **Molecular Spectroscopy (5).** Pr., CH 631.
Theory and application of optical and magnetic resonance spectroscopy.
640. **Carbohydrates (5).** Pr., CH 418 or equivalent.
The chemistry of the mono- and polysaccharides.
641. **Amino Acids and Proteins (5).** Pr., CH 418 or equivalent.
Chemistry of the amino acids and proteins.
642. **Lipids (5).** Pr., CH 418 or equivalent.
Chemistry of the lipids and their biological significance.
643. **Enzymes (5).** Pr., CH 419 or equivalent.
Physical and chemical properties and mechanisms of action of enzymes and their role in metabolic reaction.
644. **Special Topics in Biochemistry.** (Credit to be arranged.)
A selection of modern topics in biochemistry.
645. **Biochemical Research Techniques (5).** Lec. 2, Lab. 6. Pr., CH 420 or equivalent.
To acquaint the graduate students in chemistry, biochemistry, and the biological sciences with the modern techniques used in biochemistry.
646. **Physical Biochemistry (5).** Pr., CH 305 and CH 409 or equivalents.
The structure and properties of biological compounds (saccharides, lipids, amino acids, proteins, nucleic acids, and enzymes) are studied. The bioenergetics of the important metabolic pathways are also investigated. Emphasis will be on structure of biological compounds and mechanisms of biological reactions.
650. **Analytical Chemistry (5).** Pr., CH 413 or equivalent.
Analytical principles, applications and methods, mathematical interpretations, and current developments.
651. **Analytical Chemistry (5).** Lec. 4, Lab. 3. Pr., CH 413.
Analytical application of chemical spectroscopy.
652. **Theories and Current Topics of Analytical Chemistry (5).** Winter quarter, odd years. Pr., CH 651.
653. **Physio-chemical Separations (5).** Lec. 4, Lab. 3. Spring quarter, even years. Pr., CH 409.
654. **Radiochemical Analysis (5).** Lec. 3, Lab. 6. Summer quarter, odd years. Pr., CH 205.
The application of radioactive tracers and related techniques to chemical analysis.
655. **Chemical Instrumentation (5).** Lec. 5.
Chemical transducers and conversion of the transducer output to some usable form.
670. **Seminar (1).** May be repeated for a maximum of 10 credit hours. Each quarter except Summer.
Required course for all graduate students in chemistry.
691. **Directed Individual Study in Contemporary Chemistry.** (Credit to be arranged.)
Pr., completion of 30 hours of graduate courses in chemistry. May be repeated for credit.

699. Research and Thesis. (Credit to be arranged.) May be repeated for credit.
 799. Doctoral Research and Dissertation. (Credit to be arranged.)

Civil Engineering (CE)

Professors Rainer, *Head*, Bransford, and Hudson
 Associate Professors Gibson, Judkins, Krishnamurthy, and Warman
 Assistant Professors Harrison, Kraft, Molz, Moore, and Morgan
 Instructors Huner, Ramey, Seibenhener, and Smith

200. **Introduction to Civil Engineering (1).** Pr., sophomore standing.
 The Civil Engineer and his relation to society; objectives of the Civil Engineering curriculum; sub-disciplines in Civil Engineering; technical and professional engineering societies; publications; guest lectures.
201. **Surveying (5).** Lec. 4, Lab. 3. Pr., CE 202 (or concurrently).
 Data collection and analysis emphasized. Analysis of errors; simple curves, vertical curves, spirals; topographic mapping and land surveying.
202. **Introduction to Computer Methods in Civil Engineering (3).** Lec. 2, Lab. 3. Pr., MH 265 (or concurrently).
 Introduction to electronic digital computer programming; machine solution of civil engineering problems; library programs.
205. **Engineering Mechanics—Statics (4).** Pr., PS 220 (or concurrently). Coreq., MH 264.
 Basic principles of statics. Parallel, concurrent, and nonconcurrent force systems, coplanar and noncoplanar. Friction. Centroids, and moments of inertia. Simple applications of vector methods.
207. **Mechanics of Solids (3).** Pr., CE 205 or ME 205, and MH 264. Coreq., MH 265.
 Principles of strength of materials: Equilibrium, compatibility, and properties of materials. Mechanics of deformable bodies. Stress and strain, strain gage and rosettes, principal stresses and strains. Stress-strain-temperature relations. Fundamentals of continuum mechanics.
301. **Transform Methods in Engineering Analysis (5).** Pr., CE 202, MH 265.
 Applications of differential operator and Laplace transform methods to analysis of physical systems described by differential and integral equations; gamma and Bessel functions, Fourier Series, and orthogonality of functions, partial differential equations, finite difference methods, Z-transforms.
302. **Civil Engineering Economics (3).** Pr., CE 202 and junior standing.
 Principles of engineering economy applied to public works planning and design. Includes public works financing.
304. **Theory of Structures I (5).** Pr., CE 207 or equivalent, CE 301.
 Analysis of statically determinate trusses, beams and frames. Loads, reactions, internal forces, shears, and moments. Influence lines. Beam slopes and deflections by integration, moment area and conjugate beam methods. Stress distribution due to axial force, bending and shear. Introduction to column buckling.
305. **Water Supply and Disposal Systems (4).** Pr., CE 308.
 Theory and design of water collection and distribution facilities and waste water collection systems.
308. **Hydraulics (5).** Lec. 4, Lab. 3. Pr., CHE 352 or equivalent.
 Ideal fluid flow, real fluids, fluid resistance; fluid measurement and control; steady pipe flow, steady open channel flow; unsteady flow. Emphasis on steady flow and open channel flow.
315. **Engineering Geology (4).** Pr., junior standing.
 Rock classification and engineering properties. Stratigraphic sequence, folds, faults, joints, and engineering significance of these features. Formation and transport of soils. Geophysical exploration techniques.
320. **Fundamentals of Transportation Engineering (5).** Pr., EC 200, CE 201.
 An introduction to the planning, design, construction, and maintenance of surface and air transportation facilities. Economic analysis and evaluation; contracts and specifications.
380. **Theory of Structures II (5).** Pr., CE 304.
 Strain energy principles, and their application to the determination of deflections of trusses, and rotations and displacements of beams and frames, under axial force, bending, shear and torsion. Reciprocal theorem. Analysis of indeterminate structures by method of consistent deformation, moment distribution, and slope deflection.
400. **Advanced Surveying and Mapping (5).** Lec. 4, Lab. 3. Pr., junior standing.
 Photogrammetric principles and mensuration are emphasized. Selected topics from map projections, electronic and special instruments; geodesy.
404. **Structural Analysis (4).** Pr., CE 380, senior standing.
 Working stress and ultimate strength theories. Principles of stress analysis and design of structural members in steel, reinforced concrete, and other structural materials. Properties of common structural materials. Demonstration of tests.

405. **Water and Waste Water Treatment (5). Lec. 4, Lab. 3. Pr., CE 305, junior standing.**
Theory, design, construction, and operation of water treatment and waste water disposal facilities considered on a unit operations basis. Laboratory includes fundamental tests relating to both water supply and waste water treatment. Emphasis placed on theory and significance of the tests.
406. **Soil Mechanics I (5). Lec. 4, Lab. 3. Pr., CE 304, 315.**
Exploration of soils for design and construction; analysis of soil-foundation behavior for both shallow and deep foundations; laboratory analysis. Case studies.
407. **Urban Engineering I (3). Pr., senior standing.**
Duties and responsibilities of city engineer and urban consultant; problems connected with promoting, financing, designing, and constructing urban improvements.
409. **Environmental Health Engineering (5). Pr., senior standing.**
Application of engineering methodology to communicable disease control, insect and rodent control, milk and food sanitation, institutional and housing hygiene, swimming pool sanitation, rural sanitation, industrial hygiene, refuse collection and disposal, radiological sanitation, and air pollution.
410. **Transportation Engineering (5). Pr., CE 320 and IE 410, or equivalent.**
Surface and air transportation systems. Planning; economic analyses; traffic studies.
411. **Flow in Open Channels (5). Pr., CE 308 or CHE 352, junior standing.**
Uniform flow, rapidly varied flow, gradually varied flow, subcritical transitions, surges, supercritical transitions, bends, precipitous slopes, energy dissipation, spillways, and oscillatory waves.
412. **Hydrology (5). Pr., junior standing.**
Precipitation, runoff, flood routing, flood control, river regulation, and coastal engineering problems.
414. **Structural Steel (4). Pr., CE 404.**
Analysis and design of steel members in tension, compression, shear and flexure, and for combined effects. Elastic and plastic theories. Design of trusses, frameworks, and connections. Plastic design of multi-story frames.
415. **Construction Planning (5). Pr., CE 301 and junior standing.**
The construction process as a system; organization of construction engineering functions; financial analysis; cost concepts and elements in pricing; selection and evaluation of construction methods; CPM and PERT.
416. **Reinforced Concrete and Prestressed Concrete (5). Pr., CE 404.**
Ultimate strength and working stress analysis and design of reinforced concrete beams, slabs, columns and footings. Prestressing systems. Analysis and design of pre-tensioned and post-tensioned beams for flexure and diagonal tension.
417. **Soil Mechanics II (3). Pr., CE 406, junior standing.**
Slope stability; earth pressures at failure on braced and unbraced retaining structures; seepage. Case studies.
419. **Urban Engineering II (3). Pr., senior standing.**
Engineering problems of urban transportation, communications, water supply, sewerage, streets, schools, shopping, parking, and recreation facilities.
420. **Sanitary Engineering Laboratory (5). Lec. 4, Lab. 3. Coreq., CE 405, junior standing.**
Studies in the physical, chemical, and biological aspects of environmental engineering; laboratory testing procedures and experiments relating to the treatment of waters and wastes; interpretation of routine plant control analyses and indices of pollution.
421. **Water Resources Engineering (5). Pr., CE 308, senior standing.**
Environmental significance; hydrologic factors; water laws; water uses; nature, sources and abatement of pollution; quality control measures, planning.
423. **Similitude in Engineering (3). Lec. 2, Lab. 3. Pr., senior standing or consent of instructor.**
Principles of dimensional analysis and similitude. Aspects of engineering experimentation. Types and uses of models, analogies. Simple applications to engineering problems.
424. **Air Pollution (3). Pr., senior standing and consent of instructor.**
Studies of the nature of polluting materials including gases, dusts, vapors and fumes and the relations of atmospheric conditions to their dispersal. Air pollution sampling and the legal aspects of air pollution will be discussed. Approaches to air pollution control will be introduced.
425. **Soil Stabilization (3). Pr., CE 406, or equivalent.**
Methods of stabilizing soft soil: consolidation, compaction with the use of lime, cement and other additives; construction operations, costs, and field control related to soil stabilization.
426. **Air Pollution Control (3). Pr., CE 424.**
Theory and design of gravity, inertial, centrifugal and filtration devices for the control of particulate pollutants. Theory and design of adsorption and absorption devices for the control of gaseous pollutants. Control of air pollution from automobiles.

428. **Radiological Health Engineering (3). Pr., senior standing.**
Sources and properties of radiation, ionizing effects, biological effects, dosimetry, detection and measurement, design of radiation shielding, decontamination, disposal of wastes, legal aspects of radiation control, public attitudes.
430. **Foundation Design and Construction (3). Pr., CE 417 (or concurrently).**
Settlement, bearing capacity theories and construction methods applicable to spread footings, piles, and caissons. Design procedures and construction methods applicable to cofferdams, slurry trench, anchors for flexible retaining structures, and tunnels in soft ground.
489. **Civil Engineering Design (5). Lec. 2, Lab. 9. Pr., senior standing.**
A comprehensive design course devoted to developing a solution to a significant civil engineering system problem. Each student will select a project in his area of interest. (Should be taken during student's final quarter).
490. **Special Problems. (credit 1-5). Pr., permission of instructor and department head approval.**
Individual student endeavor under staff supervision involving special problems of an advanced nature in civil engineering.
492. **Linear Optimization Methods (5). Pr., MH 264, junior standing.**
Simultaneous linear equations and inequalities, vector spaces, transformation of variables, algorithms for solution or optimization of a linear expression with linear constraints, introduction to error analysis, approximation by linear expressions, separable programming, introduction to game theory.
493. **Discrete Optimization Methods (5). Pr., CE 492.**
Optimization with discrete-valued variables or combination of discrete and continuous variables. Both deterministic and probabilistic situations to be handled by sequential optimization or networks in graph theory. Adaptations of discrete and continuous variable methods, such as finite differences or integer linear programming.

GRADUATE COURSES

602. **Advanced Soil Mechanics (5). Lec. 4, Lab. 3. Pr., CE 417, or equivalent.**
Study of stress-strain characteristics of soils, stress distribution in soil media, consolidation, shear strength, and bearing capacity, with application to analysis and design of spread footings, rafts, and deep foundations; case studies.
603. **Quantitative Methods for the Planning Process (5).**
Statistical and mathematical tools useful in modern planning analysis. Surveys of various techniques to facilitate decisions in the planning process. Emphasis on the role and evaluation of modern quantitative techniques rather than technical competency. (This course is identical to URP 603).
604. **Seepage Through Porous Media (5). Pr., CE 602, or consent of instructor.**
Darcy's Law, soil permeability coefficients, unconfined and confined flow in porous media; methods of solutions; analog methods: numerical techniques, and graphical techniques; soil filters, drainage, dewatering, well flow.
605. **Soil Stability Problems (5). Pr., CE 604, or consent of instructor.**
Retaining structures including cofferdams, bulkheads, and retaining walls; stability of natural and cut slopes, embankments; earth dam design; methods of field measurements; case studies.
606. **Soil Dynamics (5). Pr., CE 602, 633, or consent of instructor.**
Wave propagations in soils, lumped systems as applied to soil-structure systems, soil properties for dynamic loading conditions; earthquakes, oscillations, and blast loading conditions; analysis and design.
607. **Soil Mechanics Instrumentation (4). Lec. 3, Lab. 3. Pr., CE 605, or consent of instructor.**
Methods of measuring pore water pressure, total stresses, and displacements of soils in the laboratory and field; case studies.
608. **Theoretical Soil Mechanics (5). Pr., CE 605, 606, or consent of instructor.**
A study of recent theoretical developments as they apply to soil mechanics. Use of digital and analog computers. Literature studies.
609. **Pavement Design (5). Pr., CE 425, 602, or consent of instructor.**
Utilization of soils for subgrades, bases, and pavements; composition and thickness design for parking, highway, and airport pavements; stress distribution of wheel loads in layered media; construction procedures; field control tests; cost analysis of pavements.
610. **Model Analysis of Structures (3). Lec. 2, Lab. 3. Pr., CE 423 or consent of instructor.**
Structural models. Direct and indirect model analysis of structures. Analogies.
611. **Transportation Planning (3). Pr., CE 603, or consent of instructor.**
The transportation planning process; trip generation, forecasting and assignment techniques; goal formulation and analysis of plans. (This course is identical to URP 611).
620. **Theory of Water and Waste Water Treatment (5).**
Concepts of chemistry and biology, applied to water and waste treatment processes.
621. **Unit Operations of Water and Waste Water Treatment (5).**
The processes of water and waste water treatment considered on a unit operations basis.

622. **Advanced Environmental Engineering Practice (5).**
Environmental sanitation and control, municipal and rural sanitation, food sanitation, control of communicable diseases, radiological sanitation.
623. **Industrial Waste Treatment (5).**
Industrial waste problems, including the characteristics of individual industries, effects on streams, and methods of treatment and disposal; treatment and disposal of radioactive wastes.
624. **Water Resource Systems I (5). Pr., CE 493.**
Applications of systems methodology to the analysis of problems involving hydrology, surface and subsurface reservoirs, flood forecasting, flood routing and reservoir design and operation.
625. **Water Resource Systems II (5). Pr., consent of instructor.**
Techniques such as simulation, linear and dynamic programming and queuing theory applied to pipe networks, open channels, transients in closed conduits, and water supply and waste water treatment systems.
626. **Water Resources Systems III (5). Pr., CE 624, 625.**
Water quality forecasting and multipurpose river basin development. The current literature will be studied.
628. **Stream Sanitation (3). Pr., CE 621 or consent of instructor.**
Physical, chemical, and biological factors involved in the degradation and self-purification of polluted streams. Field surveys will be conducted. The oxygen balance of streams will be emphasized.
630. **Advanced Structural Analysis (5).**
Response of structures and components to complex loading combinations and support conditions. Shear center, unsymmetrical bending, curved beams. Beams on elastic foundations. Torsion of non-circular sections. Column theory and buckling. Theories of failure. Inelastic theory of structures. Yield line theory of slabs.
631. **Special Topics in Structural Analysis and Design (5). Lec. 4, Lab. 3. Pr., CE 633 or consent of instructor.**
Analysis and design of plate and shell structures. Special problems in advanced structural analysis and design.
632. **Experimental Techniques in Structural Analysis (3). Lec. 2, Lab. 3.**
Basic theory, techniques and instrumentation for structural testing. Mechanical and electrical strain gages. Brittle lacquer, photogrid, and photoelastic methods. Instrumentation for structural testing.
633. **Applied Elasticity (5).**
Fundamentals of theory of elasticity, and their application to structural problems. Energy formulations and variational principles.
634. **Advanced Theory of Structures (5).**
Moment distribution of frames with multiple degrees of freedom. Minimum energy principle, conjugate structure, elastic center, and column analogy methods. Flexural members with varying moments of inertia. Arches and cables. Special topics.
635. **Numerical Techniques in Structural Analysis (5).**
Numerical methods of analysis for structural members of variable section; stiffness factors; stability, vibrations; elastic foundations, beam-columns.
636. **Dynamics of Structures (5).**
Vibration theory. Methods for computing the dynamic response of structural systems. Blast loads, earthquakes, and wind oscillations.
637. **Matrix Analysis of Structures (5).**
Displacement and force methods of matrix analysis of structures. Applications to determinate and indeterminate trusses, beams and frames. Yielding of supports, lack of fit and temperature effects. Special topics.
638. **Finite Element Methods in Structural Mechanics (5). Pr., CE 637 or consent of instructor.**
Principles of finite element analysis. Variational principles, displacement formulations. Plane stress, plane strain and axisymmetric analyses. Extensions to three-dimensional problems. Thermal stresses. Special applications.
660. **Construction Applications of Operations Research I (3). Pr., CE 492 or equivalent, and MH 460 or equivalent.**
The application of operations research methods to construction engineering; linear programming; deterministic inventory models; replacement, maintenance, and reliability models. Sensitivity analysis.
661. **Construction Engineering Functions (3).**
Organization of construction engineering functions emphasizing underlying economic principles and phenomena associated with construction engineering projects. Financial analysis, cost concepts and elements in pricing, volume-cost-profit relationships, decision-making models, and legal environment.
662. **Construction Applications of Operations Research II (3). Pr., CE 660.**
The application of operations research methods to construction engineering; dynamic programming; probabilistic inventory models; waiting-lines; simulation.

663. **Construction Engineering Methods (3). Pr., CE 660, 661.**
The application of engineering principles to the selection and evaluation of construction methods.
664. **Construction Systems Planning and Control (3). Pr., CE 662, 663.**
The construction process defined as an engineering system. Applicable methods of describing, analyzing, controlling, and manipulating collections of interrelated construction operations treated as a system; techniques of design of construction sub-systems and appropriate evaluation methods.
665. **Construction Engineering Analysis (3). Pr., CE 662, 663.**
Quantitative analysis of material handling systems with emphasis on the measurement and forecasting of productivity in construction engineering.
690. **Seminar. Credit to be arranged. May be taken more than one quarter.**
691. **Directed Reading in Civil Engineering. Credit to be arranged. May be taken more than one quarter.**
699. **Research and Thesis. Credit to be arranged. May be taken more than one quarter.**

Consumer Affairs (CA)

Professors Galbraith, *Head*, and Compton

Associate Professor Douty

Assistant Professors Hardin, Lorendo, and Smith

Instructors Brannon, Clem, and Potter

105. **Fundamentals of Clothing (5). Lec. 2, Lab. 8. Pr., CA 115.**
Basic theories and principles of garment selection and structure, including their application in construction of apparel for personal use.
113. **Housing for Man (3).**
Housing, equipment and furnishings in terms of the total environment with reference to physical, biological, economic, cultural, personal, and social conditions which affect the family.
115. **Clothing and Man (3).**
Cultural, aesthetic, functional, and technological factors as they interact to determine the meaning and use of clothing and textiles for the individual and society.
116. **Art for Everyday Living I (3). Lec. 2, Lab. 2.**
A working knowledge of basic concepts in the organization and evaluation of design with emphasis placed upon the contribution of design and color as enrichment of the environment for individual and family living.
205. **Clothing For the Family (3).**
Clothing consumption problems with emphasis on the needs of family members at all stages of the life cycle.
206. **Garment Structures—Theory and Application (3). Lec. 1, Lab. 5. Pr., CA 105.**
Problems involved in shaping fabric to the human form; processes and sequences in determining garment function and quality.
216. **Art for Everyday Living II (3-5). (3) Lec. 2, Lab. 2. (5) Lec. 2, Lab. 6. Pr., CA 116 or equivalent.**
A continuation of the individual's artistic environment with emphasis on the application of principles of design and color to specific problems of everyday life.
225. **Textiles (5). Pr., CH 103 (or concurrently).**
Fibers, yarns, fabrics and finishes in their relationship to apparel and household fabrics.
226. **Fashion Sketching (3). Lab. 6. Pr., CA 116.**
Provides for the fashion merchandising or clothing design major simple methods of communicating apparel designs through quick sketches to portray fashion in silhouettes, texture and color.
233. **Home Equipment (5). Lec. 3, Lab. 4.**
Home equipment, with emphasis on selection, use and care.
303. **The House (5). Lec. 2, Lab. 6.**
Planned to give the student an appreciation of basic plans, both period and modern, from the standpoint of utility, beauty and economy.
305. **Tailoring (3). Lab. 9. Pr., CA 105 or equivalent, junior standing.**
Selection of fabric and tailoring of a suit or coat.
310. **Mass Communication in Family and Consumer Services (3). Lec. 1, Lab. 2. 2 2-hr. Labs. Pr., SP 202.**
Responsibilities and techniques of presenting professional information and materials to the public through radio, television and live performances.

313. **Home Furnishing (5). Pr., Elementary Art or Equivalent.**
Home furnishings both from an aesthetic and practical standpoint. This includes the recognition of period furniture and its adaptability to the home of today.
316. **Fashion Analysis (5). Pr., CA 205, CA 225.**
Study and analysis of the dynamic nature of fashion and the interacting forces which shape fashion trends in apparel.
325. **Fashion Merchandising (5). Pr., MT 331, 443.**
Application of principles and practices of merchandising to the retailing of consumer goods and services.
333. **Lighting Design (5). Lec. 3, Lab. 4.**
Principles underlying the uses of color and lighting equipment in the home.
335. **Retail Training (8). Pr., CA 325.**
Three months practical experience with pay in large department store. Students are given formal instruction and supervision. Scheduled only by pre-arrangement.
343. **Interior Home Problems (5).**
Harmonious combinations of present day furnishings, materials, and finishes.
345. **Creative Crafts (1-2-3). Lab. 9.**
Design and execution of creative crafts; viz., metal work, leatherwork, ceramics, weaving, fabric decoration.
355. **Consumer Textiles (3). Lec. 3.**
Textile fabrics, finishes, and trade practices with special emphasis on consumer problems.
375. **Creative Ceramics (1-3). Lab. 9.**
Working with various clays, building processes, ceramic glazes, and ceramic design.
385. **Creative Weaving (2-3).**
Weaving design and experience in selecting yarns, setting up a loom and weaving one's own fabric.
395. **Clothing Design (5). Lec. 2, Lab. 6. Pr., CA 105, 116, 205, or equivalent.**
Color, line, form, and texture as a basis for designing apparel, with construction of technological developments, production problems, and fashion movements which influence design decisions.
405. **Costume Draping (5). Lec. 2, Lab. 9. Pr., junior standing, CA 395, and two quarters of clothing construction.**
Creative experience in development and execution of apparel designs through draping varied fabrics on individualized body structures. Exploration and application of theories and philosophies and practices of contemporary designers.
413. **Contemporary Housing and Equipment—Travel Course (5 hours—28 days).**
Course may be repeated for additional credit, not to exceed 10 credit hours (not more than 5 hours graduate credit). Pr., 10 cr. hrs. in equipment, housing, or home management; junior standing; consent of instructor.
Housing and household equipment in North European countries. Housing: historic and contemporary housing, techniques for meeting population growth, the housing of special groups, community and city planning. Equipment manufacture, distribution, testing, standardization, merchandising, power merchandising and home use. Lectures will be presented at prearranged points. A paper is required on a selected phase of the course.
415. **History of Textiles (5). Lec. 5. Pr., elementary art and junior standing.**
The development of the textile industry and of fabric design from the earliest times to the present day.
416. **Apparel Quality Evaluation (5).**
Methods for evaluating quality variations of soft goods as affected by materials, manufacturing processes, markets and resources.
423. **Equipment and Housing Technology (5). Lec. 2, Lab. 6. Pr., junior standing, MH 159 or equivalent, PS 204, PS 205, or equivalent, CH 104.**
Application of basic physical principles and the use of testing instruments with electricity and fuel gas equipment.
425. **History of Costume (5). Lec. 5. Pr., elementary art and junior standing.**
Outstanding historic modes in dress for men and women from early times to the present day.
431. **Man-Environment Relations (2). Pr., Home Economics core courses or consent of instructor.**
The unifying principles and ideals, which are concerned with man's immediate physical environment (housing, clothing, food) and with his nature as a social being. Analysis and synthesis of principles explored in Home Economics core courses CA 115, 116, NF 112, FCD 157, 257, and FCD 323.
433. **Food Equipment (3). Lec. 1, Lab. 4. Pr., junior standing, PS 204, or PS 205, CA 233.**
Principles underlying the operation and use of food equipment.
435. **Textile Testing (5). Lec. 2, Lab. 6.**
Standard testing procedures and equipment used in determining the physical and chemical characteristics of fibers, yarns, and fabrics, and of the statistical methods employed in data evaluation.

451. **Audio-Visual Education In Home Economics (3).** Pr., junior standing.
Organization and analysis of illustrative and demonstration materials in the major fields of Home Economics.
453. **The Consumer and The Market (5).** Pr., junior standing and EC 200.
Consumer problems connected with marketing; type of retail outlets, credit advertising, standardization, labeling, and price policies.
455. **Flat Pattern Designing (5).** Lec. 2, Lab. 6. Pr., junior standing, 8 quarter hours in clothing construction.
Commercial methods of pattern making. Developing a foundation pattern from which to design and cut garments. Attention is given to variations from the norm of human body measurements and to the need for further research in designing for various age groups.
456. **Comparative Methods of Apparel Production (5).** Lec. 2, Lab. 6. Pr., 8 quarter hours of clothing construction and junior standing.
End-use qualities of apparel in relation to options in methods of production and organizational procedures. Implications for consumer decisions and industrial quality control and pricing.
465. **Ceramics—Advanced Construction and Glazing (2-3).** Lab. 9. Pr., CA 375.
Advanced ceramic techniques emphasizing proficiency in wheel throwing, construction, and glazing. Independent study under tutorial guidance.
466. **Ceramics—Wheel Throwing (2-3).** Lab. 9. Pr., CA 375.
Advanced construction and glaze techniques emphasizing an individual approach, study of various glazes and glaze properties, mixing and firing of glazes formed from basic chemicals. Independent study under tutorial guidance.
473. **Contemporary Home Furnishings (3).** Lec. 1, Lab. 4. Pr., CA 313 or 343 or its equivalent.
Factors contributing to developments in the current home furnishings industry in design, manufacturing cost, and terminology. A project report is required.
475. **Creative Textile Design (5).** Lab. 9, outside work to be arranged 6. Pr., CA 116 or AT 181.
An introduction to various techniques used in the creative decoration of fabric, with experience in the execution of these techniques for both fashion and interior textiles.
476. **Textile Printing (3).** Pr., CA 475.
Various screen printing techniques, such as cut film, block out, paper stencil, photographic, etc., applicable to commercial production.
483. **Laundry Equipment and Care of Textile Articles (5).** Lec. 2, Lab. 6. Pr., junior standing, CH 104, PS 204 or 205, CA 225 or equivalent.
The physical principles involved in the laundering processes will be applied to include selection, care and proper use of laundering equipment. The reaction of the textile articles to laundry equipment will be studied. The course is team taught by a professor in householding equipment and a professor in clothing and textiles.
486. **Rug Weaving (2-3).** Lab. 9. Pr., CA 385.
The study and execution of various rug weaving techniques, their history, development, use in hand weaving and their application to commercial production.
487. **Advanced Pattern Weaving (2-3).** Lab. 9. Pr., CA 385.
Advanced pattern weaving used in hand weaving and applicable to commercial production.
490. **Independent or Field Study (3-8).**
An individual problems course involving directed readings and/or laboratory or field experiences under the direction of a faculty member on some problem of mutual interest. Field experiences may include work with families, business or industry.
493. **The House Utility Core (3).** Lec. 2, Lab. 3. Pr., junior standing, 5 hours in equipment.
A course that presents home wiring, heating and cooling, the use of water in the home, the physical arrangement, and space allocated to their use. To include kitchen, laundry, and bathroom planning.

GRADUATE COURSES

601. **Seminar (1-5).**
A. Clothing; B. Textiles; C. Equipment; D. Housing. May be taken more than one quarter for a maximum of 10 hours.
603. **Home Economics in Higher Education (5).**
The effects of scientific, technological and social developments on the family and the Home Economics profession as they have implications for higher education in this discipline. Emphasis: current trends in subject matter areas, scope and program development, administration, and instructional resources.
605. **Methods of Research in Home Economics (3).**
Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.
609. **Special Problems a) Clothing, b) Textiles, c) Equipment, d) Housing (2-5).** Pr., consent of instructor. May be taken in more than one area for a total of 10 hours.

632. **Research Techniques in Equipment and Housing (5).** Lec. 3, Lab. 6. Pr., CA 423, BY 401 (statistics) or equivalent.
A lecture and laboratory course in which problem solving techniques and methods are developed.
633. **Family Housing (5).** Lec. 5. Pr., EC 200, CA 303, CA 323.
The history and development of American housing; economical, legal and social aspects; present trends.
638. **Advanced Housing (3).** Lecture Lab. 8-12 for 12 days.
A two-week course offered in the summer quarter. A leader of some renown in the field of housing will be secured to lecture and direct laboratory work in space, form, livability, and other physical aspects of housing. Approved for graduate credit for Master of Science programs.
652. **Clothing and Textiles Literature (5).**
Written material in the field of Clothing and Textiles with special emphasis on current periodicals, pamphlets, and reports of recent research. Required of all candidates for the master's degree in Clothing and Textiles.
653. **Economics of Clothing Consumption (5).** Pr., EC 200, CA 205.
A critical examination of the literature on Clothing and Textiles economics, modern trends in manufacture and distribution and labor laws and their influence on clothing.
655. **Problems in Home Decoration (5).**
The undergraduate course, CA 313, is used as a basis for advanced work along the same lines. Problems in valuing choice of materials and arrangements of exteriors as well as interiors of the home are made the topic of minor research.
657. **Detergency and Cotton Textiles (5).**
The chemical relation of detergent, water, bleach, and mechanical action to cotton fibers (cellulose).
658. **Chemical and Physical Analysis of Textiles (5).**
The theory of A.S.T.M., A.A.T.C.C., and other standardized procedures.
659. **Modern Fibers and Fabrics (5).**
Textiles as they actually are and an evaluation of the individual properties and characteristics peculiar to all fibers.
667. **Clothing and Behavior (5).** Pr., basic courses in Sociology, Psychology, and consent of the instructor.
Clothing as a factor in the physical, social and psychological environment of man, his response to and use of clothing as an aspect of individual behavior and culture.
669. **Personality Projection Through Clothing (3).** Pr., CA 667; FCD 670 or PG 433.
Psychological processes and theories of personality in relation to clothing-oriented behavior, as supported by research. Emphasis is placed upon the interrelationships among the self, the body, and clothing at each development stage of the life cycle.
699. **Research and Thesis. Credit to be arranged.**
Required of all students under the Thesis Option in any field.

Counselor Education (CED)

Professor Grant

Associate Professors Meadows, Head, Allen, Donnan, and Foy

Assistant Professors Beasley, Crouch, Joiner, Michels, Valine, and Werner

Prerequisites and corequisites in the Department of Counselor Education are experience in teaching or other appropriate fields and employment or professional objectives leading to employment in public school counseling, rehabilitation counseling, counselor education and college student personnel work. CED 621, CED 622, or equivalent, is a prerequisite or corequisite to advanced study.

For Advanced Undergraduates and Graduates

421. **Guidance in the Public Schools (5).** Pr., senior standing.
Emphasizes understanding guidance relationships in the classroom. Not open to graduate students majoring in guidance and counseling.

Primarily for Graduate Students

621. **Principles of Guidance and Student Personnel Work (5).**
Enables students to develop a conceptual framework for viewing the inter-relationship of guidance and counseling in terms of (1) personal and social factors and (2) their place in a comprehensive program of student personnel work.
622. **Introduction to Rehabilitation Counseling (5).**
Counseling process in the rehabilitation setting. Focusing also on the historical development, duties, legal background, ethics and the setting.

623. **Medical and Adjustment Aspects of Disability I (5).** Pr., Permission of Instructor. Orientation to medical and adjustment aspects of the disabled individual. Understanding and using medical and paramedical personnel effectively in the rehabilitation process.
624. **Medical and Adjustment Aspects of Disability II (5).** Pr., CED 623.
A continuation of CED 623. Focuses on rehabilitation with the chronically disabled.
625. **Vocational Appraisal (5).** Pr., PG 415 or equivalent and permission of instructor. Appraisal of interest, aptitude, and personality tests used in the process of counseling with individuals confronted with vocational decisions. Laboratory practice in test administration, scoring, interpretation, and reporting.
626. **Case Management in Rehabilitation Counseling (5).** Pr., CED 622 or permission of instructor.
A critical analysis of representative rehabilitation cases, and case records. Attention is focused on process, diagnosis, and provision of services.
627. **Problems in Guidance (5).** Pr., permission of the instructor.
Develops competency in the application of counseling theory and research findings, with special emphasis on educational problems.
628. **Counseling Theory and Practice I (5).** Pr. or coreq., CED 621 or CED 622.
Presents alternative theoretical strategies of counseling; integrates the concepts of individual analysis and the collection and dissemination of educational and occupational information with those of counseling; prepares the student for further study of the theoretical and practical aspects of counseling.
629. **Counseling Theory and Practice II (5).** Pr., CED 628.
A continuation of CED 628.
630. **Group Dynamics in Counseling (5).** Pr., CED 621.
Studies in contemporary theories and analysis of concepts, models and pertinent research in group dynamics as it pertains to counseling.
631. **Group Procedures in Counseling (5).** Pr., CED 621, CED 628.
The history, philosophy, and principles of group counseling and guidance. Includes pertinent research, and the dynamics of group interaction in counseling settings.
632. **Organization and Administration of Guidance Programs (5).** Pr. or coreq., CED 621.
For administrative and guidance personnel. Topics discussed include principles of administrative practice, role of staff in regard to the guidance program, organizational patterns for guidance programs, possible ways of initiating a guidance program, and means of evaluation.
633. **Analysis of the Individual (5).** Pr. or coreq.; CED 621; pr., PG 415.
Assists teachers and other guidance personnel in acquiring knowledge, understanding and skill necessary to obtain records and appraise information about the pupil as an individual and as a member of a group.
634. **Counseling in the Elementary School (5).** Pr., CED 621.
Counseling and related activities are considered in the scope of pupil personnel activities as a developmental process in the elementary school.
635. **Agency Resources and Placement Services in Rehabilitation Counseling (5).** Pr., CED 622 or permission of instructor.
Development and utilization of agency resources of value to the rehabilitation counselor. Emphasis is given to placement services and opportunities in working with the disabled.
637. **Theories of Vocational Development (5).** Pr., CED 621 or permission of instructor.
Designed to analyze theories of vocational development with special emphasis on the integration and practical application of the theories in counseling.
638. **Information Services in Guidance and Counseling (5).** Pr., or coreq., CED 621 or CED 622.
Helps school counselors develop an understanding of the individual appraisal service and its relationship to counseling; the educational and occupational information service and its relationships to counseling.
646. **Studies in Education (1-3).** Pr., One quarter of graduate study and consent of department head. May be repeated for credit not to exceed 3 hours.
A special problem in administration, supervision, guidance, or higher education using research techniques. (Credit in ED 651 prior to 1960 excludes credit for this course.)
647. **Supervisory Procedures in Rehabilitation Counseling (5).** Pr., AED 670 and permission of instructor.
Procedures and practices specific to the supervision of rehabilitation counselor and counselor-related services in rehabilitation agencies.
648. **Planning and Program Development in Rehabilitation Counseling (5).** Permission of instructor.
Trends in program development, planning, and evaluation of research and theoretical writings in the area. A comprehensive study of research and demonstration projects in rehabilitation counseling.
650. **Seminar in Area of Specialization (1-5).** Pr., Permission of instructor.
Provides for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.

651. **Internship in Area of Specialization (1-15). Pr., Permission of the instructor;** may be repeated for credit not to exceed 15 hours.
Provides advanced graduate students with full-time, supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods, designed to provide positive evaluation and analysis of the field experience.
653. **Counseling Programs in Higher Education (5). Pr., CED 621.**
Emphasizes the integration of counseling functions within the total student personnel program in higher education, legal and ethical aspects of counseling and student personnel work, and communication problems between groups within the institution and community.
654. **College Student Development; Implications For Counseling and Student Personnel Work (5). Pr., IED 663.**
Emphasizes the developmental characteristics of college students, student culture and environment, student movements, research concerning the diversity of college student populations and implications for counseling and student personnel programs.
656. **Research and Evaluation in Counseling (5). Pr., FED 661 and permission of the instructor.**
Measurement, appraisal, and evaluation of a broad range of objectives in counseling and guidance. Emphasis on criteria, techniques and research procedures necessary to evaluate counselor programs.
659. **Practicum in Area of Specialization. Credit to be arranged. Pr., Permission of major professor. No more than 10 hours of practicum credit may be earned at the Master's level.**
The practicum provides advanced graduate students with supervised experiences with emphasis on the application of concepts, principles, and skills acquired in previous course work.
699. **Research and Thesis. Credit to be arranged. May be taken more than one quarter.**
798. **Field Project. Credit to be arranged. May be taken more than one quarter.**
799. **Research and Dissertation. Credit to be arranged.**

Economics and Geography (EC) (GY)

Carl W. Hale, *Head*

Professors Anson, Chastain, Richardson, Ritland, Kern,
Kinsey, Klontz, and Steele

Associate Professors Boston, Street, and Main

Assistant Professors Bagwell, Bellante, Bushey, Dorman, Greene, Howard,

Icenogle, Lacy, Stanaland, and Whitten

Instructors Alban, Dison, Jackson, and Sherling

Economics (EC)

200. **Economics I (5). Pr., sophomore standing.**
Economic principles with emphasis upon the macro-economic aspects of the national economy.
202. **Economics II (5). Pr., EC 200.**
A continuation of economic principles with emphasis upon micro-economic aspects of the economy.
206. **Socio-Economic Foundations of Contemporary America (3). General elective.**
The social and economic developments which lead to and help toward an understanding present day American society.
350. **Labor Economics (5). Pr., EC 202, junior standing.**
A theoretical and institutional examination of the labor market, including wage theories, unionism, the economics of collective bargaining, and problems of insecurity.
360. **Money and Banking (5). Pr., EC 202 or AS 202, junior standing.**
Money, credit and banking including consideration of monetary systems, foreign exchange and commercial banking with relation to the Federal Reserve System.
402. **American Industries (5). Pr., EC 200, and junior standing.**
Selected industries, emphasizing economic factors affecting growth, organization and operation.
444. **Labor Legislation (5). Pr., EC 350 or EC 445 and junior standing.**
Analysis of background, content, and significance of industrial relations, wage and hour, and selected social security laws.
445. **Industrial Relations (5). Pr., EC 200 and junior standing.**
Analysis of legislation, collective bargaining, union-management cooperation, and economic conditions bearing upon employer-employee relations.

446. **Business Cycles (5).** Pr., EC 202 and junior standing.
The causation of economic cycles, their measurement and proposed means of control.
451. **Intermediate Microeconomics (5).** Pr., EC 202, junior standing.
The theory of pricing under varying market conditions and distribution of income among the factors of production.
452. **Comparative Economic Systems (5).** Pr., EC 202, junior standing.
An analysis of the rival economic doctrines of Capitalism, Socialism, and Communism.
453. **Economics of Growth and Development (5).** Pr., EC 202 and junior standing.
Concepts, principles and problems of economic growth and development with consideration of appropriate policies for both underdeveloped and advanced economies.
454. **History of Economic Thought (5).** Pr., EC 202, junior standing.
The development of economic ideas, principles, and systems of analysis from early times to the present.
455. **Social Control of Industry (5).** Pr., EC 202 and junior standing.
The economic effects of the control of industry by governmental agencies. Emphasis will be on the welfare aspects of government regulations.
456. **Intermediate Macro-economics (5).** Pr., EC 202 and junior standing.
The measurement of national output, with income and employment theory, general equilibrium theory, and theories of interest, investment, and consumption.
457. **Economic History of Europe (5).** Pr., EC 200 and junior standing.
Economic contributions of the medieval period; mercantilism; laissez-faire; developments in agriculture, industry, transportation, trade, and banking.
458. **Economic History of the United States (5).** Pr., junior standing.
Development of the economic institutions, growth of industries, regional specialization, and relation of government to business enterprise from the Colonial period to the present.
459. **Regional Economic Development (5).** Pr., EC 202 and junior standing.
Analytical discussion of the principles associated with the regional development of a national economy. Emphasis is on the problems of lagging regions and on the experience of the United States.
460. **Introduction to Econometrics (5).** Pr., MH 161 or equivalent, AS 202 or EC 202 or equivalent, and EC 274 or equivalent, and junior standing.
Formulation of Elementary Economic models using Economic Theory and Mathematics with certain basic assumptions or axioms. Mathematical tools used in Economic Analysis.
462. **Monetary Theory and Policy (5).** Pr., junior standing and EC 360.
Intermediate monetary theory and policy. Attention given to empirical studies. Substantial readings from original sources required.
464. **Economics of Multi-Level Government (5).** Pr., EC 202 and junior standing.
Deals with the needs and resources of state and local (including special district) governments. Analyzes the relationships between the various levels of taxation, bond issues and spending of a Federal government.
465. **Public Finance (5).** Pr., EC 202, junior standing.
The problems faced by governmental units in raising and spending funds efficiently are discussed from the historical, institutional, and economic points of view. The course attempts to relate fiscal policy to monetary policy as government seeks to promote stability and growth.
471. **International Economics (5).** Pr., EC 451 and junior standing, or permission of instructor.
An examination of the pure theory and monetary aspects of international trade.
485. **Mathematical Economics (5).** MH 161, EC 451, and EC 456.
An introduction to mathematical methods in Economics. Fundamental propositions of micro and macro economic theory are derived mathematically.

GRADUATE COURSES

600. **National Income and Capital Accumulation (5).** Pr., EC 456 and graduate standing or consent of the instructor.
An advanced study of general equilibrium theory with emphasis on the theories of interest, investment, and consumption.
601. **Value and Distribution (5).** Pr., EC 451 and graduate standing or consent of instructor.
Positive content and limitations of modern theories of value, wages, rents, and profits.
607. **Regional and Urban Economics (3).** Graduate standing and consent of instructor.
The economic forces involved in planning a dynamic urban region; the principles of and applications for regional economic models; the role of quantitative models of urban development in metropolitan policy-making. (Cross listed as URP 607.)
622. **Theory of Wages and Labor Mobility (5).** Pr., EC 350 and EC 451 or permission of instructor.
Includes advanced study of various theories of wage determination and of theories and empirical studies of labor supply and mobility.
650. **Economic Seminar (1-10).** Pr., graduate standing or consent of instructor.
For those students engaged in intensive study and analysis of economic problems.

654. **Advanced History of Economic Thought (5).** Pr., EC 454 or consent of instructor.
The development of economic thought with emphasis upon Classical and Neo-Classical authors and their critics. The contributions of each writer are examined in the economic context from which they emerged and their influence on economic thought and national policy considered.
662. **Seminar in Money and Banking (5).** Pr., EC 360 and consent of instructor.
Goals, procedures, and achievements in attaining monetary objectives at home and abroad. Special emphasis is given to published research results.
665. **Seminar in Public Finance (5).** Pr., EC 360, EC 465, and graduate standing or consent of instructor.
Theory and principles of public finance at an advanced level with special emphasis on fiscal policy.
671. **International Economics and Finance (5).** Pr., EC 471.
Advanced foreign trade theory and balance of payments analysis, exchange rates, capital movements, financial institutions. Current problems in international finance.
690. **Special Problems (1-5).**
Variable content in the economics area.
699. **Research and Thesis.** Credit to be arranged.

Quantitative Methods (EC)

274. **Business and Economics Statistics I (5).** Pr., MH 151, MH 161 or equivalent and EC 200 or AS 202.
Frequency distribution and time series analysis; index numbers; probability; binomial and normal distributions; introduction to statistical inference.
374. **Quality Control (3).** Pr., EC 274.
Methods of assuring quality through commodity and process control. Economic acceptance plans, control charts, use of correlation and other statistical methods in quality control.
474. **Business and Economic Statistics II (5).** Pr., junior standing and EC 274 or equivalent.
Probability distributions including the Poisson and "t" distribution; advanced time series analysis; chi square; multiple and partial correlation; statistical decision theory.
475. **Quantitative Methods of Economics and Business (5).** Pr., junior standing and EC 274.
Quantitative methods and their application in production and distribution problems of business.

GRADUATE COURSES

608. **Business Research (5).** Pr., EC 474, and graduate standing or consent of instructor.
The theory and practice of research through the mail survey, the personal interview, study of documents and observation. The analysis and presentation of research findings will be stressed.
660. **Econometrics (5).** Pr., EC 451, EC 474, EC 446 or EC 465, AS 460.
Application of mathematics and statistical methods to the problems of economic analysis. Econometric models of the economy as a whole and of individual sectors will be considered.
674. **Business and Economic Statistics III (5).** Pr., EC 474, or equivalent.
Design of experiments; analysis of variance and covariance; fitting of Gompertz and other growth curves; selected nonparametric statistical methods.
675. **Managerial Statistics (5).** Pr., EC 474 or EC 475.
Application of classical and Bayesian statistical decision theory in the solution of management problems.
699. **Research and Thesis.** Credit to be arranged.

Geography (GY)

102. **Principles of Geography (5).** Not open to juniors or seniors except with consent of instructor.
Man and his work in relation to the Earth as a planet, location, climate, land forms, water bodies, minerals, soils, biota.
201. **Weather and Climate (5).** Pr., sophomore standing.
Weather and climate, their causes and controls. Characteristics and distribution of world climates with their economic and social effects.
203. **Economic Geography (5).** Pr., GY 102 or sophomore standing.
Distribution and environmental relations of man's principal economic activities.
301. **Geo-Political Basis of World Powers (5).** General elective. Pr., junior standing.
The interaction between the natural-physical environment and the international activities of world powers. Emphasis is placed upon the changing geographic and economic patterns in world affairs.

303. **Geography of the Soviet Union (5). Pr., junior standing.**
The physical and human geography of the U. S. S. R. and its role in international affairs.
304. **Geography of South America (5). Pr., junior standing.**
A regional survey of economic and social developments, resources and products.
305. **Geography of North America (5). Pr., junior standing.**
Human-use regions, resources, social and economic developments will be studied.
306. **Geography of Europe (5). Pr., junior standing.**
The influences of climate, surface features, and natural resources on the distribution of peoples, their industries and routes of trade. Consideration will be given to each country within its regional setting and to the relationship of Europe to the remainder of the world.
307. **Geography of Asia (5). Pr., junior standing.**
Climate, topography, and natural resources and their influence upon the distribution of peoples, their industries and commerce.
308. **Geography of Africa (5). Pr., junior standing.**
The principal regions of Africa with particular emphasis on the areas and countries of greater economic and international importance.
340. **Cartography (5). Pr., junior standing or permission of the instructor.**
Techniques of map construction, with attention given to both the drafting and interpretation of maps and other graphic presentations.
400. **Development of Geographic Thought (5). Pr., junior standing and GY 102 or consent of instructor.**
The development of modern geographic thinking with special attention to the methodology employed in the science of geography.
404. **Physical Geography of the World (5). Pr., junior standing.**
Selected elements of physical geography. Soil, water, minerals, flora and fauna will be studied.
405. **Cultural Geography of the World (5). Pr., junior standing.**
The influence of physiographic factors in the social, economic and political development of people and states.
407. **World Resources and their Utilization (5). Pr., junior standing.**
The world's principal natural resources are studied primarily from the geographic point of view (location, transportation, topography, water supply, power sources, climate, etc.).
410. **Geography of Alabama (5). Pr., junior standing.**
The geographic characteristics of the State.
420. **Urban Geography (5). Pr., junior standing and GY 102 or permission of instructor.**
The location, character, and growth of urban centers, with special attention to their interior patterns of land use and cultural development.
460. **Geography of Manufacturing (5). Pr., junior standing or permission of the instructor.**
World manufacturing regions with emphasis on the United States. Location patterns of selected industries will be examined from the standpoint of location theory.

GRADUATE COURSES

650. **Geography Seminar (5). Pr., graduate standing or consent of instructor.**
Designed for students engaged in intensive study and analysis of problems in geography.

Educational Media (EM)

Assistant Professor Hug, *Head*

Associate Professors Dawson and Miller

Assistant Professors Beilke, Klontz, and Sheppard

Instructors Anthony, Cobb, Nemsik, Nist, and Wright

The instructional program of the Department of Educational Media includes: (1) courses leading to certification as a school librarian, (2) courses leading to certification as a media specialist, and (3) electives for students majoring or minoring in other areas.

ADVANCED UNDERGRADUATE AND GRADUATE

400. **Learning Resources (4). Pr., junior standing.**
Identifying and utilizing criteria for the selection of media; attention to unique contributions of particular media; production of learning materials.
410. **Media for Children (4). Pr., junior standing.**
Examination and evaluation of printed and other types of materials in view of their relevance to the needs and interests of various age and grade levels of elementary school children. Study of selection aids, principles, and criteria for selecting materials.
415. **Media for Young Adults (4). Pr., junior standing.**
Study and evaluation of books and other media in relation to the interests, needs, and abilities of young adults.

430. **Reference Materials and Services (4).**
Study and evaluation of basic reference sources for learning resources centers. Elementary research methods of locating information and the role of various types of reference books as resource material in curricular units are considered.
440. **Organization and Administration of Media Centers (4).** Pr., junior standing, EM 400.
Basic organization of books, non-book materials, and services for effective use in media centers. Administering the budget, selection and purchase of materials, preparation of materials for use, circulation of materials, inventory, care and repair of materials, and instruction in the use of media are considered.
450. **Classification and Cataloging of Media (4).** Pr., junior standing, EM 400, 410, or 415, 430, and 440.
Principles and procedures of classifying and cataloging books and other printed materials, filmstrips, recordings, and community resources. The vertical file, the Dewey decimal system of classification, Wilson and Library of Congress printed cards, and subject headings are studied.
470. **Cybernetic Principles of Learning Systems (4).** Pr., junior standing.
The organization of mediated instruction into learning systems designs utilizing feedback control and modification. Includes implications for instructional strategies formed to function in the continuous progress school with special emphasis on the media center.
495. **Practicum in Media Services (1-10)** (May be repeated for credit not to exceed 10 hours). Pr., junior standing, EM 450.
Provides students with supervised experience in various work settings with emphasis on the application of concepts, principles, and skills acquired in previous course work.

GRADUATE COURSES

600. **Technology in Education (4).** Pr., EM 400 or its equivalent, or consent of department head.
Theory, problems, procedures, and standards in the utilization of technology.
605. **Modes of Mediated Instruction (4).** Pr., EM 600.
Development and integration of media into learning prescriptions. Emphasis is on the assigning of media in a total systems approach to curriculum building.
620. **Principles of Media Services (4).** Pr., EM 600.
Place and function of media services in the American educational system. Historical development of learning resources centers; media services to teachers and pupils as an integral part of the school program; standards and administrative policies are included.
625. **Problems in the administration of Media Services (4).** Pr., EM 600.
Current problems relating to an effective program of media services.
630. **Media Services in the School and Community (4).** Pr., EM 600.
Community relations; historical background, current trends; problems and programs of service; relation to public and rural library extension service; selection of materials on the basis of community and curriculum needs; book lists and exhibits.
646. **Studies In Education (1-3).** Pr., one quarter of graduate study. May be repeated for credit not to exceed 3 hours.
Special problems as they relate to instructional design media, and/or media service.
650. **Seminar in Educational Media (1-10).** May be repeated for credit not to exceed 10 hours. Pr., permission of department head.
Special problems formulated around students area of specialization designed to engage students in an intensive study and analysis of problems identified.
651. **Research in Educational Media (5).** Pr., 36 hours in Media and professional education.
Analysis and review of research with an emphasis on the individual's research needs.
654. **Evaluation of Media Programs (2-5).** Pr., permission of department head.
An intensive study of factors contributing to effective organizational configurations.
699. **Research and Thesis.** Credit to be arranged. May be taken more than one quarter.
798. **Field Project.** Credit to be arranged. May be taken more than one quarter.

Electrical Engineering (EE)

Professors C. Carroll, Head, Graf, Haeussermann, Holmes,
Honnell, Lowry, Phillips, and Russell

Associate Professors Barnes, Feaster, Hickman, Nichols, Rogers, and Slagh

Assistant Professors Albritton, Boland, B. Carroll, Irwin, James,
Miller, and Nagle

Instructors Amoss, and Carter

- 201. Introduction to Electrical Engineering (3).** Pr., sophomore standing.
The electrical engineer and his contributions to society; the digital computer as an Electrical Engineering tool; programming solutions to typical Electrical Engineering problems.
- 262. Circuits (3).** Coreq., PS 222, MH 265.
The first of three courses in electrical sciences; emphasis on circuit analysis.
- 273. Electronic Devices (3).** Pr., EE 262.
The second of three courses in electrical sciences; emphasis on electronics.
- 322. Combinational Logic Circuits (3).** Pr., junior standing, or consent of instructor.
Boolean algebra and special forms of Boolean expressions; logic, logic elements, and logical design; number systems, introduction to codes and computer elements.
- 324. Sequential Machines (3).** Pr., EE 322.
Models of sequential systems; completely and incompletely specified sequential circuits; Mealy-Moore transformation; introduction to asynchronous machines.
- 325. Logic and Computing Systems Laboratory (1).** Pr., EE 322 or concurrently.
Students perform experiments on digital logic simulators which illustrate combinational logic design, counters, adders, shift registers, and other basic logic units.
- 326. Fault-Detection in Logic Circuits (3).** Pr., EE 322.
Fault testing in combinational circuits, stuck-at-one and stuck-at-zero faults, derivation of fault test sequences, implications in logic design.
- 327. Error Detecting and Correcting Codes (3).** Pr., EE 322, MH 266.
Parity checks, Hamming codes, polynomial codes and codes which detect bursts, applications to digital systems.
- 354. State-Space System Analysis (3).** Pr., EE 362, MH 266.
State-space analysis of linear physical systems including digital computer solution of system equations.
- 361. Network Analysis (5).** Lec. 4, Lab. 3. Pr., EE 262.
Topological properties of networks; the single-storage element circuit; the phasor and the frequency domain; magnetically coupled circuits; polyphase circuits; two-port networks.
- 362. Linear Systems (5).** Lec. 4, Lab. 3. Pr., EE 361.
Fourier series; Fourier transforms; Laplace transforms, stability; analogous systems.
- 372. Electronics I (4).** Pr., EE 273, EE 361.
Semiconductors; electronic devices; equivalent circuits of active devices.
- 373. Electronics II (5).** Lec. 4, Lab. 3. Pr., EE 372, EE 362.
Amplifiers, oscillators; modulation; feedback.
- 381. Electromagnetic Devices (4).** Lec. 3, Lab. 3. Pr., EE 273.
The third of three courses in electrical sciences; emphasis on electromechanics; laboratory experimentation includes instrumentation, circuits, electronics and electromechanics.
- 383. Electromechanical Energy Conversion (4).** Lec. 3, Lab. 3. Pr., EE 381, EE 362.
Matrix algebra; linear transformations; symmetrical components; the generalized machine; direct current machines; induction machines; synchronous machines; systems of inter-connected machines.
- 391. Electromagnetics I (3).** Pr., PS 222.
Scalar and vector fields; the electrostatic field; the magnetostatic field; Maxwell's equations; boundary conditions.
- 392. Electromagnetics II (4).** Pr., EE 391.
Energy and power relations for the electromagnetic field; time varying fields; plane waves; theory and application of guided waves.
- 393. Electromagnetics III (4).** Lec. 4, Lab. 3. Pr., EE 392.
Continuation of guided waves; introduction to radiating systems; coordinated laboratory demonstrations and experiments.
- 397. Introduction to Acoustics and Noise Control (3).** Pr., MH 265, or consent of instructor.
Acoustical terminology and units; acoustic wave equation; propagation of sound waves; psychoacoustics; microphones and loudspeakers; basic sound measurements and analysis; noise control.
- 412. Electrical Properties of Materials (3).** Pr., EE 393, PS 320.
Studies of the electrical properties of materials with emphasis on semiconductors.
- 413. Physical Electronics (3).** Pr., EE 412.
Physical principles of electrical and electronic devices.
- 422. Digital Computer Architecture (3).** Pr., EE 322.
Sequence generators, counters, arithmetic units, memory systems, interfaces and I/O devices, machine instructions and system operation.
- 424. Digital Computing Systems (3).** Pr., EE 422.
Digital computers currently in use, minicomputers, future generation computers, system designs for science and business, micro-minitization.
- 425. Computer Organization (3).** Pr., EE 322.
Assemblers, program library, principles of programming, multiprogramming and time-sharing, operating systems, introduction to compilers.

426. **Computer Applications in Electrical Engineering I (3).** Pr., MH 266, IE 205.
Time domain analysis of deterministic systems; digital computer representation of analog systems; difference equations; applications of numerical integration; computational methods for processing random data.
427. **Computer Applications in Electrical Engineering II (3).** Pr., EE 426.
Computer simulation of problems from all phases of the Electrical Engineering curriculum. Students required to solve these problems using a general purpose computer.
446. **Analog Computers (3).** Lec. 2, Lab. 3. Pr., EE 273 and junior standing.
Computer programming including time and amplitude scaling; computer solution of linear, non-linear, and partial differential equations; simulation of various types of physical systems.
452. **Automatic Feedback Control Systems (5).** Lec. 4, Lab. 3. Pr., EE 362.
Transfer functions; root locus plots; Nyquist and Bode diagrams; compensation.
454. **Introduction to Modern Control Theory (3).** Pr., EE 452.
Describing functions; phase plane; sampled-data systems; state space.
455. **Automatic Control Instrumentation (3).** Lec. 2, Lab. 3. Pr., EE 452.
Sensors and transducers; modulators and demodulators for a-c control systems; power amplifiers; corrective networks; prime movers.
464. **Introductory Network Synthesis (3).** Pr., EE 362 and junior standing.
Introduction to the synthesis of passive networks, with emphasis on driving point functions.
465. **Advanced Circuit Analysis (3).** Pr., EE 362 and junior standing.
Matrix analysis of circuits; network parameters; three and four terminal networks; special topics.
471. **Communication Theory (5).** Lec. 4, Lab. 3. Pr., EE 373.
Topics in communication and electronic systems.
473. **Communication Systems (3).** Pr., EE 471 and junior standing.
Theoretical topics in modern communication systems.
474. **Solid State Electronics (3).** Lec. 2, Lab. 3. Pr., EE 373, EE 391, and junior standing.
Applied solid-state physics; selected topics in advanced solid-state devices and circuits; integrated circuits.
483. **Energy Conversion and Distribution (3).** Pr., EE 383 and junior standing.
Further practical aspects of energy conversion and distribution.
485. **Power Systems Engineering (4).** Lec. 3, Lab. 3. Pr., EE 383.
Fundamentals of power systems; topics in modern power systems engineering; economic factors in power systems; use of the digital computer in power systems design and analysis.
486. **Direct Energy Conversion (3).** Pr., EE 383, EE 392, ME 301.
Fundamentals; batteries and fuel cells; thermoelectric devices; thermionic devices; photo-voltaic devices; magnetohydrodynamic power generation.
490. **Seminar.** Credit to be arranged. May be taken more than one quarter.
494. **Electromagnetic Propagation (3).** Pr., EE 393 and junior standing.
Principles of wave propagation in communication systems; study of propagation modes; introduction to interaction of electromagnetic waves and plasmas.
495. **Microwaves (3).** Pr., EE 392 and junior standing.
Analysis of distributed systems including waveguides and transmission lines; generation and detection of microwave energy; coordinated laboratory experiments and demonstrations.
496. **Antennas (3).** Pr., EE 393 and junior standing.
Analysis of radiating systems, to include individual radiators and antenna arrays; impedances in radiating system design; antenna performance measurement techniques; coordinated laboratory experiments and demonstrations.

GRADUATE COURSES

601. **Linear Analysis I (5).**
Methods of analysis, the exponential forcing function, Fourier series, Fourier transform, Laplace transform, and superposition integrals. Complex variables and contour integration.
602. **Linear Analysis II (5).** Pr., EE 601.
Generalized four terminal networks; network parameters, equivalent circuits, and interconnection of networks. Signal-flow diagrams, stability and transients on transmission lines.
605. **Active Circuits (5).** Pr., consent of instructor.
The analysis of active-device circuits: negative-resistance circuits and devices, amplifiers, oscillators, modulators, and demodulators.
610. **Power Transmission Systems (5).** Pr., EE 601.
Power transmission systems operating under both normal and fault conditions; problems of design, protection, relaying, and metering; various types of instabilities; application of digital computers to problems in power transmission.
612. **Advanced Topics in Electromechanical Energy Conversion (5).** Pr., EE 601.
Dynamic equations of motion of electromechanical systems; the generalized rotating electro-mechanical energy converter; dynamics of systems; the n-m symmetrical machine.

617. **Principles of Pulse Circuits (5). Pr., EE 601.**
Analysis and design of basic types of pulse forming circuits, with applications to pulse systems and laboratory work suited to the individual student's needs.
620. **Nondeterministic Systems Analysis (3). Pr., consent of instructor.**
Applications of probability, random variables, and stochastic processes in Electrical Engineering.
621. **Switching Theory (5). Pr., graduate standing or consent of instructor.**
Number systems, Boolean Algebra, combinational logic, minimization and decomposition of switching functions, NAND and NOR synthesis, bilateral networks, introduction threshold logic, fault-detection and numerical methods in combinatorics.
622. **Finite State Machines (3). Pr., EE 621.**
Synchronous sequential circuits and iterative networks, finite-state modeling, state equivalence and machine minimization, incompletely specified machines, synchronous sequential circuits, linear sequential machines.
623. **Coding Theory (3). Pr., EE 621.**
Error detection and correction, linear codes, cyclic codes, BCH codes, coding bounds, shift register sequences, and coding systems.
624. **Threshold Logic (3). Pr., EE 621.**
The threshold element, capabilities and limitations of threshold logic, synthesis of threshold networks, identification and realization of threshold functions, applications of threshold logic.
625. **Fault Detection in Combinational Logic Circuits (3). Pr., EE 621.**
Fault tests for combinational circuits with and without fan-out, test derivation techniques, fault testing for redundant circuits, test length bounds, implications in designing logic circuits.
626. **Digital Computer Architecture I (3). Pr., EE 621.**
Structures for the central digital computer are studied, arithmetic units, machine language decoders, data bus devices, memory organization, introduction to parallel processors, this course is hardware oriented.
627. **Digital Computer Architecture II (3). Pr., EE 626.**
Development of software systems, operating systems, interpreters, assemblers, and other translators, monitors, data file organization and management, introduction to compilers, this course emphasizes the impact of software on hardware design.
628. **Digital Computer Projects Laboratory (TBA). Pr., EE 621 or equivalent.**
Selected students design and breadboard a simple stored-program computer, the design includes hardware implementations of CPU, memory, I/O, and control unit; an assembly language and translator to machine code is also completed.
629. **Digital Computer Peripherals (3). Pr., EE 621.**
Introduction to digital computer ancillary equipment to include core memory, disk and drum storage, magnetic tape transports, analog-to-digital and digital-to-analog converters, paper tape devices, teletypewriters, card readers, and line printers.
640. **Digital Computing Systems (3). Pr., EE 621.**
Present and next generation digital computers; minicomputers, multiprocessors, business and scientific oriented models; diverse uses of digital computers today, future trends and applications for digital computers.
641. **Multiprocessing Systems (3). Pr., EE 626.**
Configurations, memory allocation and protection, multiprogramming, processor control, simulation, task scheduling and system applications.
642. **Fault-Tolerant Computing (3). Pr., EE 625.**
Architecture and design of fault-tolerant computer systems using protective redundancy for fault masking and automatic repair; fault location and diagnosis; hardware and software techniques for the recovery from errors; estimation of the reliability, availability, and related parameters of fault-tolerant systems.
643. **Computer Software Development (3). Pr., EE 627.**
Programming systems and languages, interactive systems, philosophy of operating systems, program-program interfaces, problems in data management, software maintenance and reliability.
644. **Theory of Compilers (3). Pr., EE 627.**
Formal properties of grammars, syntactic analysis, lexical analysis, analytical modeling, macro generators, code selection, hard-wired compilers, and extensible languages are typical topics studied.
645. **Advanced Sequential Systems (3). Pr., EE 622.**
Autonomous and quiescent linear sequential circuits, cycle sets, synthesis, and applications.
646. **Pattern Recognition (3). Pr., EE 621.**
Correlation methods, discriminant analysis, maximum likelihood decisions, minimax techniques, perception-like algorithms, feature extractions, preprocessing, clustering and non-supervised learning.
647. **Digital Filter Theory (3). Pr., EE 682.**
Digital filter transfer function synthesis, digital equivalents for analog filters, optimal digital filters, non-linear filtering, the effects of signal amplitude quantization.

648. **Digital Filtering Applications (3). Pr., EE 647.**
Mechanization of digital filters by hybrid methods, digital computers, and LSI; time-sharing and range-switching to improve filter performance; applications in control systems, speech processing, radar tracking, and spectral analysis and synthesis.
- 650-1-2. **Electromagnetic Theory and Applications I-II-III (5-5-5). Pr., consent of instructor.**
A three-course sequence for students specializing in electromagnetics.
653. **Antennas (5). Pr., consent of instructor.**
Advanced treatment of radiating systems.
654. **Electronic Computer Theory (5). Lec. 4, Lab. 3. Pr., EE 601.**
General study of computer components; operational amplifiers, function generators, multipliers, stabilized power supplies; pulse circuits, memory storage devices and read-out devices; techniques of computer operation.
655. **Hybrid Computation (3). Pr., graduate standing.**
Advantages and disadvantages of analog and digital computers and techniques for combining both for more efficient problem solution, time-scaling, interface equipment, signal sampling, interpretation of results.
656. **Network Synthesis I (5). Pr., EE 601.**
Two-terminal passive networks; properties, realizability, and principles of synthesis. Conventional and modern filter synthesis.
657. **Network Synthesis II (5). Pr., EE 656.**
Four-terminal passive networks; properties, realizability and principles of synthesis. Potential analogy and approximation problems.
658. **Advanced Acoustics and Noise Control (3). Pr., consent of instructor.**
Acoustic wave equation and propagation of sound waves; acoustical transducers; instrumentation; room acoustics; psychoacoustics; special topics in noise control.
660. **Quantum and Parametric Electronics (5). Pr., consent of instructor.**
Atomic phenomena, quantum theory, kinetic theory and statistical mechanics; applications to electronic devices and systems.
- 670-1. **Information Theory I-II (5-5). Pr., EE 601.**
Probability; random variables; and stochastic processes. Analysis of channel models and proofs of coding theorems; construction of error-correcting codes; statistical properties of information sources.
- 675-6. **Communication Theory I-II (5-5). Pr., EE 670.**
Signal detection and selection; modulation and coding; demodulation and decoding; contemporary topics in communication theory.
680. **Directed Reading in Electrical Engineering. Credit to be arranged.**
- 681-2-3. **Automatic Control Theory I-II-III (5-3-3). Pr., consent of instructor.**
Advanced analysis and design of control systems, including modern and classical control theory as applied to linear, nonlinear, continuous, and discrete systems.
690. **Seminar. Credit to be arranged. May be taken more than one quarter.**
- 691-2-3. **Advanced Automatic Control Theory I-II-III (3-3-3). Pr., consent of instructor.**
Optimal control theory for deterministic and non-deterministic systems; optimal linear filter theory; modern stability theory.
699. **Research and Thesis. Credit to be arranged. May be taken more than one quarter.**
799. **Research and Dissertation. Credit to be arranged. May be taken more than one quarter.**

Elementary Education (EED)

Professors Coss, Head, Ellis, and Newell
Associate Professors Cadenhead, Roughton, and Sartin
Assistant Professors Allen, Causey, English, Jensen, Justice, Noland,
Wilmoth, and Wright
Instructors Adams, Johnson, Polmatier, and Willard

Each of these courses, 102, 103, 104, 301, 302, 303, 401, 402, and 403, applies to the following areas of the school program: (A) Early Childhood Education, (B) Elementary Education, (C) Special Education-Mental Retardation, (D) Special Education-Behavior Disturbance.

Orientation

102. **Orientation for Transfer Students (1).**
Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.

103. **Orientation for Freshmen (1).**
Helps freshman in planning their professional careers.
104. **Orientation to Laboratory Experiences (1).**
Required of all students completing the Teacher Education Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.

Reading Improvement

Available as a service course and as a general elective to all University students.

310. **Reading Improvement (3). Lec. 2, Lab. 2. General elective.**
Developmental reading for students who wish to improve their reading skills. Each student's present degree of reading efficiency is diagnosed and a program structured to his individual needs is planned and conducted.

Curriculum and Teaching

Undergraduate

301. **Curriculum I; Reading and Other Language Arts; Music and Related Arts (10). Lec. 8, Lab. 6. Pr., junior standing, coreq., FED 214.**
Skills, techniques, and materials in the language arts curriculum, and the musical and rhythmic activity program in the content of laboratory experiences with children.
302. **Curriculum I; Reading and Other Language Arts (6). Lec. 5, Lab. 3. Pr., junior standing.**
For students who have completed the creative expression portion of this course at another institution.
303. **Curriculum I; Music and Related Arts (4). Lec. 3, Lab. 3. Pr., junior standing.**
For students who have completed the language arts portion of this course at another institution.
320. **Curriculum for Early Childhood Education (10). Lec. 8, Lab. 6. Pr., junior standing, coreq., FED 214.**
Communication arts appropriate for children ages four through eight. Laboratory activities, to be coordinated by the Department of Elementary Education and Family and Child Development, will include observation and participation with children in the University Child Study Center, Head Start programs, and public schools.
396. **Music for the Elementary Teacher (3). Pr., MU 371 or consent of department head.**
Elective course for Elementary Education Majors who need additional instruction in music.
401. **Curriculum II; Mathematics, Natural and Social Sciences (10). Lec. 8, Lab. 6. Pr., junior standing, coreq., FED 320.**
Developing understandings, skills, and attitudes in the elementary mathematics and science (natural and social) curriculum with emphasis on laboratory experiences and the use and construction of learning materials.
402. **Curriculum II; Mathematics and Natural Science (6). Lec. 5, Lab. 4. Pr., junior standing.**
For those students who have completed the social science portion of this course at another institution.
403. **Curriculum II; Social Science (4). Lec. 3, Lab. 2. Pr., junior standing.**
For those students who have completed the mathematics and science portion of this course at another institution.
420. **Curriculum for Early Childhood Education II (10). Lec. 8, Lab. 6. Pr., EED 320, coreq., FED 320.**
Social and natural science experiences in the environment of children ages four through eight. Laboratory activities, to be coordinated by the Departments of Elementary Education, and Family and Child Development, will include observation and participation with children in the University Child Study Center, Head Start programs, and public schools.
425. **Professional Internship in Elementary School (15). Pr., Sr. standing, Admission to Teacher Education prior to Internship, appropriate professional courses. (A) Early Childhood Education (B) Elementary Education.**
(For description, see Professional Internship in School of Education Section.)
450. **Analysis of Elementary Instructional Strategies (3). Pr., Professional Internship Lec. 2, Lab. 2.**
Patterns of elementary curriculum and organization for instruction, including the analysis of previous and current laboratory experiences in education. Attention given to implementation of system's approach in student's area of specialization.
455. **Analysis of Early Childhood Education Programs (3). Lec. 2, Lab. 2. Pr., EED 420 and Professional Internship.**
Curriculum and organization of early childhood programs are evaluated. Previous and current laboratory experiences are related to current trends in early childhood education. Laboratory activities will be coordinated by the faculties in the Departments of Elementary Education, and Family and Child Development.

459. Independent Study (1-10). Designed to enable students to pursue topics of special interest in depth in Elementary Education. May be repeated for credit not to exceed 10 hours.

Advanced Undergraduate and Graduate

461. Current Theory and Practice in the Teaching of Reading (5). Pr., junior standing and teaching experience or consent of department head.
Principles of reading instruction within the settings of the areas of child development, learning theories, individual differences, the role of reading in the total school and community environment, and examination of current reading materials.
474. Problems in Improvement of Reading at the Elementary School Level (5). Pr., junior standing and teaching experience or consent of department head.
An examination of problem areas of effective reading instruction in grades one through nine. Emphasis on phonetic word attack skills, comprehension, vocabulary building and the use of supplementary materials in the reading program.
496. Music in the Elementary School (5). Pr., junior standing.
To give the individual teacher a deeper insight into skills, techniques, and knowledge of music. Appropriate materials, adapted to social and musical interests of children, are studied and evaluated.
497. Organization of Elementary School Music (3). Pr., junior standing and EED 303 or IED 423.
Theory and development of the music program in the elementary school.

Graduate

620. The Early Childhood Education Program (3-10). Pr., Bachelor's degree.
Curriculum, teaching-learning process, materials, and facilities appropriate for young children will be studied in a laboratory environment.
621. Current Trends in Early Childhood Education (5). Pr., EED 620 or Bachelor's degree in Early Childhood Education.
An investigation of developments, issues, and trends in early childhood education curriculum.
622. Seminar in Early Childhood Education (3-10). Pr., EED 621. May be repeated for credit not to exceed 10 hours.
Contemporary problems in early childhood education. Intensive study in areas of interest and need.
623. Practicum in Early Childhood Education (3-10). Pr., EED 621. May be repeated for credit not to exceed 10 hours.
Integration of theory and practice which enables the student to test within the school environment appropriate teaching-learning programs.
624. Research in Early Childhood Education (5). Pr., EED 621.
Review, analysis, and interpretation of research in areas of early childhood education.
641. Diagnostic Procedures in Reading (5). Pr., EED 461 or consent of department head.
Administration, scoring and interpretation of specific reading tests to determine causes of reading disability. Formal and informal evaluation procedures for regular and remedial classrooms. Screening tests for contributing factors to reading disability. Analysis and implication for correction of reading difficulties.
642. Remedial Procedures in Reading (5). Lec. 3, Lab. 4. Pr., EED 641 or consent of department head.
Appropriate individual and group techniques for correcting deficiencies and practice in continuing evaluation of reading difficulties. Use of equipment and materials with children having reading problems.
646. Studies in Education (1-3). Pr., one quarter of graduate study. May be repeated for credit not to exceed 3 hours.
A research problem will be selected in consultation with the professor who will supervise it. The problem should contribute to the program of the student. (Credit in ED 651 prior to 1960 excludes credit in this course.)
649. The Elementary School Program (5).
Major curriculum areas and teaching practices in the modern elementary school. Attention given to implications of research and theory for the total elementary school program.
650. Seminar in Elementary Education. 3-10 hours. May be repeated for credit not to exceed 10 hours.
Critical analysis and evaluation in elementary education with emphasis on improving the instructional program. An opportunity to do intensive study on selected topics.
656. Directed Individual Study in Reading Diagnosis and Reading Remediation (5). Pr., EED 642 or consent of department head.
Clinical experiences in diagnosing problems in reading and related areas. Also clinical experiences in the remediation of reading problems.
657. Individualizing Instruction in Elementary Schools (5).
Analysis of programs for individualizing instruction. Emphasis will be on design, implementation, and management.

Curriculum and Teaching in the Respective Areas of the Elementary School Program

Each of these courses 651, 652, 653 and 654 applies to the following areas of the elementary school program: (G) Language Arts, (H) Mathematics, (K) Science, and (L) Social Science.

651. **Research Studies in Education in Areas of Specialization (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.
Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **Curriculum and Teaching in Areas of Specialization (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.
Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **Organization of Program in Areas of Specialization (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.
Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **Evaluation of Program in Areas of Specialization (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.
Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
- 659-660. **Practicum in Areas of Specialization (5-5).**
Provides advanced graduate students with supervised experience with emphasis on the application of concepts, principles, and skills acquired in previous course work.

Thesis

699. **Thesis Research.** Credit to be arranged. May be taken more than one quarter.
798. **Field Project.** Credit to be arranged. May be taken more than one quarter.
799. **Doctoral Research and Dissertation.** Credit to be arranged. May be taken more than one quarter.

For advanced courses in curriculum, higher education, and special education, see IED.

English (EH)

Professors Patrick, *Head*, W.S. Allen, Amacher, Benson, Breyer,
N.A. Brittin, Burnett, Current-Garcia, Haines, M. Jones,
Littleton, Nist, Woodall, and Wright
Associate Professors Butler, Hudson, McLeod, and Rose
Assistant Professors R. Brittin, Hitchcock, K. Jacobs,
Logue, Melzer, Mowat, Patterson, and Stroud
Instructors J. W. Allen, Brown, DeLeeuw, Gwin, Hug, Jeffrey,
Kyper, Lehmann, Martin, Solomon, J. P. Waters, M. Waters,
and Weissinger
Teaching Associate Andersen

The requirements for the English major enrolled in the School of Arts and Sciences are stated on page 104 and for the English major enrolled in the School of Education, on page 99.

English Composition (101-102-103 or 105-106) is required of all students and is a prerequisite for all other courses in English.

- 101-102-103. **English Composition (3-3-3).** EH 101 pr. for EH 102; EH 102 pr. for EH 103. All quarters.

The essentials of composition and rhetoric. Reading of selected fiction, poems, and plays.

- 105-106. **Honors Freshman English (3-3).** EH 105 pr. for EH 106. All quarters.
Reading and composition for superior students. Students earning a C or better final grade in both courses will receive 9 hours of credit. The student falling under a C grade changes to the regular sequence (101-102-103) and completes a total of three courses. (Departmental approval required for admission to this sequence.)

141. **Medical Vocabulary (3).** Fall, Winter, Spring.
Prefixes, suffixes, and the more common root words of medical terminology.

- 253-254-255. Survey of English Literature (3-3-3). EH 253 pr. for 254; EH 253-254 pr. for EH 255. All quarters.
English literature from Beowulf to the present.
- 260-261-262. Survey of Literature of Western World (3-3-3). Credit in this sequence precludes credit in EH 253-254-255.
Master works from Homer to Faulkner; 260, Classic and Medieval; 261, Renaissance and Eighteenth Century; 262, Nineteenth and Twentieth Centuries.
301. Creative Writing (3). General elective. Fall, Spring.
The writing and criticizing of short stories. But the student may be permitted to write poetry, drama, or any other form of imaginative literature.
302. Creative Writing (3). General elective. Fall, Spring.
A continuation of English 301.
304. Technical Writing (3). All quarters. Not open to students with credit in EH 345.
Report writing for engineers.
310. Word Study (3). General elective. Fall, Spring.
The history of English words and their meanings with the object of improving the student's command of his language and illustrating for him some of the patterns in the development of human thought.
312. The European Novel (5). Spring.
The reading and analysis of significant novels by major European writers.
320. An Introduction to Drama (3). General elective. Winter.
Representative tragedies and comedies of Europe from antiquity to the present. Such figures as Sophocles, Moliere, Shakespeare, and Ibsen will be considered.
325. The Short Story (5). Winter.
The development of the short story in America and Europe from the early nineteenth century to the present.
330. Medieval English Literature (5). Spring.
This course concentrates on *La Morte d'Arthur*, *Sir Gawain and the Green Knight*, *Pearl*, *Piers Plowman*, *The Owl and the Nightingale*, medieval drama. Glossed texts in the original dialects are used. Excludes Chaucer.
340. The Classical Background (5). Fall. Not open to students with credit in EH 108.
Readings from the major Greek and Roman writers. The texts studied are chosen with particular attention to their subsequent influence upon English and American literature.
345. Business and Professional Writing (5). All quarters. Not open to English majors or minors. Credit in the course precludes credit in English 304.
Practical composition including abstracting, correspondence, and reports for students in business.
350. Shakespeare's Greatest Plays (3). General elective. Fall. Not open to students with credit in EH 451-452.
Some of Shakespeare's masterpieces.
352. Contemporary Fiction (5). Fall.
American and British novelists from Lawrence to Faulkner.
353. Contemporary Drama (5). Spring.
Continental, British, and American dramatics from Ibsen to the present day.
357. Survey of American Literature (5). Fall, Spring.
American literature from the beginning to 1860.
358. Survey of American Literature (5). Winter.
American literature from 1860 to the present.
360. Continental Fiction (3). General elective. Winter.
Representative European short stories and novels.
361. History of English Drama (5). Winter.
English drama from the medieval period to 1900.
363. Eighteenth Century English Literature (5). Winter.
Poetry and prose from Dryden through Shenstone.
365. Southern Literature (3). General elective. Spring.
372. The American Novel (5). Fall.
The development of the American novel from the beginning to 1900.
381. The Literature of the Age of Reason (3). General elective. Fall.
The Enlightenment in the Old World and the New with special attention to religion, science, political theory, and philosophy in such major writers as Swift, Voltaire, Kant, and Lessing, Locke, Paine, and Franklin.
390. Advanced Composition (5). All quarters.
The practice and theory of expository writing; the command of language for the clear and forceful communication of ideas.
394. Introduction to Linguistics (5). Winter.
The phonological, morphological, and syntactical systems of late modern English.

401. **English Syntax (5).** Fall, Spring. Pr., junior standing.
A detailed survey of the underlying structure of English sentences, with some consideration of the historical development of those structures.
405. **Chaucer (5).** Not open to graduate students. Winter.
The major works of Chaucer in Middle English.
410. **European Literature (5).** Winter. Pr., junior standing.
The principal European literary figures and trends from the Renaissance to the present, with emphasis on the literature of Italy, France, and Germany.
425. **Comedy and Satire (5).** Pr., junior standing.
The theory and appreciation of two closely interrelated literary genres, based on the reading of representative examples from the literature of the Western World.
430. **The Craft of Fiction (5).** Pr., junior standing, EH 301-302, consent of instructor. Winter.
The writing of fiction.
441. **History of the English Language (5).** Spring. Pr., junior standing.
The chronological development of the English language.
450. **Contemporary Poetry (5).** Winter. Pr., junior standing.
The chief modern poets of England and America.
- 451-452. **Shakespeare (5-5).** Fall, Winter, Spring. Pr., junior standing. Credit for either or both of these courses excludes credit for EH 350.
The first quarter deals with the plays written before 1600, emphasizing comedies; the second, with the plays written after 1600, stressing tragedies.
456. **The English Romantic Movement (5).** Spring. Pr., junior standing.
Romantic poetry from Gray to Keats.
457. **Victorian Literature (5).** Winter. Pr., junior standing.
The major poets and nonfiction writers from 1830 to 1890.
459. **Poetry and Prose of the English Renaissance (5).** Fall. Pr., junior standing.
The nondramatic literature of the Tudor Period.
463. **Eighteenth Century English Literature (5).** Spring. Pr., junior standing.
Poetry and prose from Johnson through Blake.
- 481-482. **English Novel (5-5).** Fall, Winter. Pr., junior standing.
The first quarter: Development of fiction from the Greek Romances down through the Renaissance and then concentrates on the great English novelists of the eighteenth century. The second quarter: The English novel from Jane Austen to Thomas Hardy.
491. **American Poetry (5).** Fall, alternate years. Pr., junior standing.
Major American poets from the Colonial period to 1920.
492. **American Drama (5).** Fall, alternate years. Pr., junior standing.
American dramatic and stage history from Colonial times to the nineteenth century, with emphasis on developing tastes and techniques.
495. **Southern Literature (5).** Spring. Pr., junior standing. Not open to students with credit in EH 365.
The poetry, fiction, and nonfiction prose writings in the South from Revolutionary times to the present, with major emphasis centering on Southern regional attitudes and trends.
- 498-499. **Readings for Honors (5-5).** Pr., junior standing with a minimum of 2.0 overall average, a 2.5 average in at least five upper division English courses, and the consent of the English Department.
Individual reading programs in a specific period or phase of literature or language, as determined by the instructor and student. An honors essay and a written examination will be required.

GRADUATE COURSES

610. **Introduction to Graduate Study (5).** Summer, Fall, Winter.
- 611-612. **Studies in the History and Interpretation of Literature (5-5).** Summers only.
614. **The Theory of Prose Fiction (5).** Spring.
Methods and techniques of prose fiction, particularly as they developed during the late nineteenth and early twentieth centuries. The course will focus on the close study of selected novels and criticism.
- 616-617. **Studies in the American Language (5-5).** Summers only.
620. **The English Language I: Old English (5).** Fall.
621. **The English Language II: Middle and Modern English to 1500 (5).** Winter. Pr., EH 620.
623. **Beowulf (5).** Winter. Pr., EH 620.
625. **Medieval Literature (5).** Fall.
626. **Chaucer (5).** Spring.

- 627. Linguistics I: Phonology and Morphology (5). Fall, Summer.
- 628. Linguistics II: Syntax and Grammar (5). Summer, Winter.
- 629. Linguistics III: Formal Stylists (5). Spring.
- 631. Elizabethan and Jacobean Drama (5). Fall.
- 632. Spenser (5). Spring 1974. Alternates in Spring with 636.
- 633. Studies in the Poetry and Prose of the English Renaissance (5). Winter.
- 634. Poetry and Prose of the Seventeenth Century (5). Winter.
- 635. Studies in Shakespeare (5). Spring.
- 636. Milton (5). Alternates in Spring with 632.
- 640. Restoration and Eighteenth Century English Drama (5). Spring.
- 641. Studies in the Age of Pope (5). Fall.
- 642. Studies in the Age of Johnson (5). Winter.
- 650. Studies in English Romanticism (5). Winter.
- 652. Victorian Poetry (5). Spring.
- 653. Victorian Prose (5). Fall.
- 654. Studies in the Nineteenth Century English Novel (5). Spring.
- 660. Modern Poetry (5). Spring.
- 661. Modern Fiction (5). Winter.
- 662. Studies in Twentieth Century Literature (5). Fall.
- 670. American Literature of the Colonial and Revolutionary Periods (5). Spring.
- 671. Studies in American Literature, 1800-1860 (5). Alternates in Summers and Winters with 673.
- 672. Studies in American Literature, 1860-1914 (5). Fall.
- 673. Studies in the Literature of the South (5). Alternates in Summers and Winters with 671.
- 680. The History of Literary Criticism (5). Alternates in Summers and Winters with 681.
- 681. The History of Literary Criticism (5). Continuation of EH 680. Alternates in Summers and Winters with 680.
- 684-685. Directed Individual Study (5-5).
- 699. Research and Thesis.
- 799. Research and Dissertation.

Family and Child Development (FCD)

Professors Compton and Hodson

Associate Professor M. Layfield

Assistant Professors Toulaiatos, Head, Current-Garcia, Hinton, and Horn

Instructors Porter and Williams

- 107. Prenatal and Infant Development (5). Lec. 4, Lab. 2.
Principles of growth and development of children from conception through second year of life.
- 110. Contemporary Home Economics (1).
Philosophy and new directions of Home Economics.
- 157. Family and Human Development (3).
Principles of human development as it is affected by the family and a study of the family as it affects and is affected by the culture.
- 208. Physical Health in Early Childhood (2).
Early childhood diseases and their effects on individual development, the family, and society.
- 267. Growth and Development of Children (5). Lec. 4, Lab. 2. Pr., PG 211, SY 201.
The mental, physical, social and emotional growth and development of children with emphasis on the early years. Students observe children in the child study laboratories.

287. **The Child in a Culturally Disadvantaged Family (5).** Lec. 4, Lab. 2.
Conditions in society disadvantageous to growth and development of children.
304. **Dynamics of Marriage (3).**
Male and female roles in mate choice, marriage, adjustment, parenthood and marriage problems. Open to men and women.
308. **Mental Health in Early Childhood (3).**
The understanding of emotions and means of coping with them to safeguard mental health of individuals and society. Laboratory experiences where needed.
310. **Techniques of Interviewing (2).** Pr., approval of department.
Principles and techniques of interviewing and establishing a helping relationship with individuals and groups.
317. **Adolescent and the Family (5).** Lec. 4, Lab. 2. Pr., FCD 107, 267 or consent of instructor.
Growth and development of the adolescent in relation to formative influences, problem areas, and implications.
323. **Theories of Home Management (3).** Pr., junior standing.
Management of human and nonhuman resources for the maximum development of the individual and the family.
333. **Consumer Oriented Legislation (5).** Pr., junior standing.
Chronology of consumer legislation in the United States up to the present. Examination and evaluation of government agencies involved in consumer protection. Treatment of consumer rights by the courts.
337. **Family Relationships (5).** Pr., junior standing.
Interpersonal relationships among family members, with attention to human development, training and guidance of children.
377. **Comparative Family Life (3).**
The impact of cultural variations upon the structure and function of the family.
409. **Independent Studies.** Credit to be arranged (1-3). Pr., consent of department head. May be taken only one quarter.
Individual course of study to be designed by professor in response to special non-recurring academic need of student.
417. **Guidance of Children (3).** Lec. 3. Pr., FCD 267, and junior standing.
Environmental factors affecting the development of children in the home and community. Emphasis is given to principles and methods of guidance. Students participate in the guidance of the children in both the nursery school and kindergarten.
- 417L. **Guidance of Children Laboratory (2).** Lab. 6. Laboratory work in guidance of children. Hours to be arranged. Must be taken concurrently with the corresponding lecture course.
437. **Learning Experiences for Young Children (3).** Lec. 3. Pr., junior standing.
Methods of promoting cognitive development of children.
- 437L. **Learning Experiences for Young Children Laboratory (2).** Lab. 6.
Laboratory work in the child study center. Hours to be arranged. Must be taken concurrently with corresponding lecture course.
441. **Family Financial Management (5).** Pr., junior standing, CA 453 or equivalent.
Budgeting and consumer problems faced by the family.
443. **Home Management Residence (5).** Pr., junior standing, FCD 110, CA 113, CA 115, CA 116, NF 119, FCD 157, FCD 323, CA 431.
Residence in the home management house gives actual experience in different phases of homemaking with emphasis placed on the management process, satisfactory group relations, and development of individual initiative.
447. **Laboratory Experiences with Young Children (5).** Lec. 2, Lab. 9. Pr., junior standing and FCD 437.
Increased student responsibility for the guidance of children under supervision of the faculty.
460. **Management Problems in the Home (3).** Lec. 2, Lab. 2. Pr., FCD 323, FCD 337, junior standing.
The processes of decision-making in families for realization of values and goals through the effective use of human and material resources. Supervised observation in selected homes and analysis of case studies.
467. **Parent Education (5).** Lec. 3, Lab. 4. Pr., junior standing and FCD 267, FCD 337, SC 273 or equivalent.
A study of the principles of working with parents on both an individual and group basis.
468. **Women's Changing Roles and Potentialities (3).** Pr., junior standing.
A critical analysis of women's changing roles in society. Effects of these changes on the family and on women's self-fulfillment and social contributions.
471. **Supervision of Child Study Centers (5).** Lec. 3, Lab. 4. Pr., FCD 447 and junior standing.
Practical supervision of programs for young children.

477. **The Aged and His Family (3).**
The aged and his family as affected by problems of health, finances, leisure time, housing and relationships. Laboratory experiences where needed.
487. **Introduction to Field Experiences (2).** Pr., SY 406, FCD 310, and approval of department head.
Introductory course designed to help students prepare for maximum utilization of supervised professional experiences.
497. **Directed Field Experience (5 to 15; may be repeated for a maximum of 15 hours).** Pr., FCD 487 and approval of department head.
(A) Social Services, (B) Family and Child Development, (C) Maternal and Child Health. Field experiences to be arranged in approved community agencies or groups which work with children and families. All placements are made on an individual basis and supervised by staff.
499. **Seminar (2).** Pr., FCD 497 and approval of department head.

GRADUATE COURSES

605. **Methods of Research in Home Economics (3).** Pr., PG 215 or equivalent.
Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.
609. **Special Problems. Credit to be arranged (2-5).** A. Family Relations; B. Child Development; C. Home Management; D. Family Economics. Pr., approval of department head. May be taken more than one quarter. Not to exceed 5 hours credit toward minimum of 45 for M.S.
630. **Trends and Supervision in Home Management (5).** Pr., FCD 323 and FCD 443 or permission of instructor.
Developments, trends and supervision in home management.
631. **Readings in Home Management (5).** Pr., FCD 323.
An analysis and evaluation of literature and research studies in Home Management.
634. **Economic Problems of Families (5).** Pr., FCD 323, CA 453.
Income distribution, cost of living, the business cycle, taxation, and economic provisions for unemployment, health, accidents, old age, and dependents.
635. **Advanced Home Management and Equipment (3).** Pr., graduate standing.
A three-week course offered in summer quarters only.
636. **Analysis of Home Management Problems (5).** Lec. 3, Lab. 4. Pr., FCD 323 or equivalent, or consent of instructor.
Work analysis and adaptation of technological improvements in using management principles of human and non-human resources (time, energy, and income).
650. **Personality Development (5).** Pr., FCD 267 or equivalent.
The development of personality of the child with particular emphasis on the effects of family interaction in the early years.
651. **Advanced Child Development (5).** Pr., FCD 650 or PG 433 or departmental approval.
Review, interpretation, and evaluation of substantive areas of child development emphasizing changes in knowledge of these areas as a result of recent research.
652. **The Family and Its Relationships (5).** Pr., SY 301, FCD 337, FCD 650 or PG 433, or departmental approval.
Intensive study of the family and its effect on personality development.
654. **Parent-Child Relations (5).** Pr., FCD 337, FCD 650, or departmental approval.
Discussion of parent-child relations and evaluation of relevant research literature.
655. **Child Guidance (5).** Pr., FCD 650 or PG 433, or departmental approval.
Survey of principles and techniques of child guidance.
656. **Readings in Family Life and Child Development (5).** Pr., FCD 267, FCD 337, or departmental approval.
Current literature and research concerning the pre-school child; the school-age child; the adolescent; the young adult; problems of later maturity; changing family patterns.
659. **Group Approaches to Family Counseling (5).** Pr., CED 628, FCD 650, FCD 652, or departmental approval.
Small group counseling for family-related problems through the therapeutic understanding of human relationships.
660. **Seminar (1-5).**
A. Family Relations; B. Child Development; C. Home Management; D. Family Economics.
699. **Research and Thesis. Credit to be arranged.**
Required of all students under the Thesis Option in any field.

Fisheries and Allied Aquacultures (FAA)

Professors Swingle, *Head*, Dendy, Lawrence, and Shell
Associate Professors Allison, Boyd, Lovell, Moss, Prather, and Ramsey,
Rogers, and Snitherman
Assistant Professors Davies, Jeffrey, Schmittou, and Grover
Research Associate Plumb

Principles of Biology, BI 101 and Animal Biology, BI 103 are prerequisite to most courses offered in this department. For a description of these and other general biology courses see the section on Biology.

210. **Fish Culture (3). Lec. 3. Winter. General elective.**
Construction and management of ponds, and the principles underlying fish production; also fishing methods, bait production, and the identification of the more common sport fish. (May not be taken for credit by students who have already earned credit in a more advanced course in fisheries.)
312. **Practical Fish Culture (5). As arranged.**
Credit will be arranged for 3 months in a state or federal hatchery or in an approved commercial hatchery or on other phases of fish culture. All students wishing to take this course must obtain permission to do so from the Head of the Department.
415. **Linnology (5). Lec. 3, Lab. 6. Spring. Pr., CH 104, PS 205, BI 103 and junior standing.**
Biological, chemical, and physical factors affecting aquatic life.
416. **Biological Productivity and Water Quality (3). Lec. 1, Lab. 6. Fall. Pr., CH 208 or consent of instructor and junior standing.**
Biological and chemical measures of water quality in streams and impoundments as related to fisheries. Effects of pollution, fertilization, and feeding of fish upon water quality.
428. **Hatchery Management (5). Lec. 3, Lab. 4. Spring. Pr., BI 103 and junior standing.**
Operation of hatcheries for production of cold- and warm-water game fish and bait minnows; care of brood fish; methods of stocking, fertilizing, supplementary feeding, and controlling weeds; transportation of fish; control of parasites; and related hatchery problems.
430. **Pond Construction (5). Lec. 1, Lab. 8. Fall. Pr., junior standing.**
Principles and practice in the selection of pond sites, surveying and mapping pond areas, and construction of dams, spillways and diversion ditches.
436. **Management of Small Impoundments (5). Lec. 3, Lab. 6. Summer. Pr., BI 103 and junior standing.**
Consideration of the species of fish used in management of small impoundments, species balance, population balance analysis, methods of correcting unbalanced conditions, renovation of old impoundments, and related problems of water management.
437. **Fisheries Biology (3). Pr., BI 103 and junior standing.**
An introduction to the study of vital statistics of fish populations.
438. **General Ichthyology (5). Lec. 3, Lab. 6. Fall. Pr., BI 103 and junior standing.**
Morphological, functional, geographical, and behavioral survey of fishes. Classification of fishes using monographs and keys. Field trips and laboratory work will emphasize local species.
445. **Fish Parasitology (3). Lec. 1, Lab. 6. Fall. Pr., BI 103 and junior standing.**
Basic concepts of fish parasitology and epizootology, identification and control of fish parasites.
446. **Fish Diseases (3). Lec. 1, Lab. 6. Spring. Pr., BY 300 and junior standing.**
Bacterial and viral diseases of fishes, their isolation, culture identification, and control.
447. **Management of Streams and Large Impoundments (3). Lec. 3. Fall. Pr., FAA 437, or permission of instructor, and junior standing.**
Fish populations of streams and large impoundments and a consideration of methods for managing those populations.
498. **Special Problems in Fisheries and Aquacultures (1-3). Pr., senior standing.**
A student can register for a total of not more than three hours credit.
615. **Advanced Fisheries Biology (5). Lec. 4, Lab. 3. Summer. Pr., FAA 437.**
The concepts of population dynamics and of the interaction of reproduction, growth, and mortality in fish populations. Use of these concepts in fish population management.
616. **Systematic Ichthyology (3). Lec. 3. Winter. Pr., FAA 438 or permission of instructor.**
Fishes of the world, emphasizing morphology, distribution, and life history. Review of world literature on fish systematics.
617. **Nutrient Cycles in Aquaculture (3). Winter. Pr., FAA 415, FAA 416 and ZY 306 or consent of instructor.**
An advanced discussion of physicochemical and biological dynamics of inorganic nutrients in freshwater habitats. Emphasis will be given to fish culture problems caused by nutrient imbalance.

618. **Aquaculture (5). Winter. Pr., FAA 416.**
Principles underlying aquatic productivity and levels of management as demonstrated by domestic and foreign lotic and lentic cultures of fish and other aquatic crops.
620. **Fish Processing Technology (5). Lec. 3, Lab. 6. Fall, even years. Pr., CH 208 and BY 300 or ADS 414.**
Chemical and biological aspects of fishery products as they are related to the use of these products for human foods; principles of preservation; unit operations in processing; packaging, storage, and distribution.
621. **Fish Nutrition (5). Lec. 3, Lab. 6. Fall, odd years. Pr., CH 208 and course in physiology or nutrition or consent of instructor.**
Fundamental and applied aspects of fish nutrition including the physiology of food assimilation, nutrient requirements, nutrient chemistry of feed sources, ration formulation and practical feeding.
645. **Advanced Fish Parasitology (3). Lec. 1, Lab. 6. Winter. Pr., FAA 445.**
The morphology, taxonomy, life history, ecology and pathological effects of parasites of fish.
693. **Seminar. (Credit to be arranged.)**
698. **Special Problems in Fisheries and Allied Aquacultures (2-5).**
699. **Research and Thesis. (Credit to be arranged.)**
799. **Doctoral Research and Dissertation. (Credit to be arranged).**

Food Science (FS)

The Food Science curriculum is administered by an interdepartmental committee with K. M. Autrey, Department of Animal and Dairy Sciences, as Coordinator. Food Science courses are listed by cooperating departments (Animal and Dairy Sciences, Horticulture, Nutrition and Foods). A description of the curriculum in the School of Agriculture and a list of required and elective courses may be found on page 78.

Foreign Languages (FL)

Professor Peak

Research Professor of Comparative Linguistics Skelton

Assistant Professors Posniak, *Acting Head*, Helmke, Reyes, and Warbington

Instructors Cox, Friedman, Gaar, Howard, Jimenez, Madrigal, Millman,

Morris, Swint, Vandegrift, and Wolverton

Special Lecturer Ihrig

It is to the student's advantage to begin foreign language at the highest possible level because by so doing he can gain college credits through advanced placement. On the basis of the Foreign Language Department's evaluation of his previous foreign language training and/or test scores, he may enter the second, third, or fourth quarter course in a language. If he makes a grade of C or higher, he will receive 10, 15, or 20 hours, respectively (5 credit hours for the course and 5, 10, or 15 hours, respectively, for advanced placement). If the student is well enough prepared, he may enter at a level higher than the fourth quarter, but he will not receive more than 15 hours through advanced placement.

If he does not earn at least a C, he will not be granted advanced placement credit. He may then enter the language at a lower level, re-enter at the same level, or attempt another approved language.

Credits earned through advanced placement may be applied toward graduation as well as toward foreign language requirements in various curricula.

French

121. **Elementary French I (5).**
To give the student the fundamentals of the French language together with as much simple reading as time will permit. Constant stress will be placed on oral and aural practice.
122. **Elementary French II (5). Pr., FL 121 or equivalent.**
A continuation of FL 121.
221. **Intermediate French I (5). Pr., FL 122 or equivalent.**
Provides practice in reading, writing and speaking current French. Special emphasis is placed on the acquisition of vocabulary through reading and composition.
222. **Intermediate French II (5). Pr., FL 221 or equivalent.**
An introduction to French literature. Representative works of moderate difficulty and high literary value will be read. Practice in speaking and writing will continue.

321. **Advanced French I (5). Pr., FL 222 or equivalent.**
Outstanding prose works, especially short stories and novels. Continued emphasis on vocabulary building through composition based on literature read.
322. **Advanced French II (5). Pr., FL 222 or equivalent.**
A continuation of FL 321.
421. **Contemporary French Literature I (5). Pr., FL 322 or equivalent.**
Selected readings in the literature of the nineteenth and twentieth centuries. Advanced practice in conversation.
422. **Contemporary French Literature II (5). Pr., FL 322 or equivalent.**
A continuation of FL 421.
423. **Survey of French Literature (5). Pr., FL 422 or departmental approval.**
The development of French literature from the *Chansons de geste* through the classical period.
424. **Survey of French Literature (5). Pr., FL 422 or departmental approval.**
A continuation of FL 423. The development of French literature from Romanticism to the modern period.
427. **Independent Work in French I (5). Pr., FL 423 or FL 424 or departmental approval.**
For the superior student majoring in French. A reading course to be completed with a term paper.
428. **Independent Work in French II (5). Pr., FL 423 or FL 424 or departmental approval.**
For the superior student majoring in French. A reading course to be completed with a term paper.

Spanish

131. **Elementary Spanish I (5).**
Structure of the Spanish language, with practice in speaking, reading, and writing.
132. **Elementary Spanish II (5). Pr., FL 131 or equivalent.**
A continuation of FL 131.
231. **Intermediate Spanish I (5). Pr., FL 132 or equivalent.**
Designed to acquaint the student with the civilization of Spain while providing practice in reading, speaking, and writing.
232. **Intermediate Spanish II (5). Pr., FL 231 or equivalent.**
Spanish literature. Representative works of outstanding Spanish writers will be examined. Practice in writing and speaking continues.
331. **Advanced Spanish I (5). Pr., FL 232 or equivalent.**
Recognized works of Spanish and Spanish-American writers with a review of Spanish grammar and practice in composition and conversation.
332. **Advanced Spanish II (5). Pr., FL 232 or equivalent.**
A continuation of FL 331. Continued emphasis on vocabulary building through composition and conversation.
431. **Spanish American Literature I (5). Pr., FL 332 or equivalent.**
Selected readings in Spanish American poetry and drama as a general survey. Written and oral reports in Spanish.
432. **Contemporary Spanish Literature (5). Pr., FL 332 or equivalent.**
Selected readings in the literature of Spain with emphasis upon the post-civil war period. Written and oral reports in Spanish.
433. **Survey of Spanish Literature (5). Pr., FL 432 or departmental approval.**
The development of Spanish literature from *Poema del mio Cid* through the Golden Age.
434. **Survey of Spanish Literature (5). Pr., FL 432 or departmental approval.**
A continuation of FL 433. The development of Spanish Literature from the Decadencia to the contemporary period.
435. **Spanish American Literature II (5). Pr., FL 332 or equivalent.**
The novel and essay in Spanish American literature as a general survey with special emphasis on the principal authors and movements. Written and oral reports in Spanish.

German

151. **Elementary German I (5).**
The structure of the German language, with practice in speaking, reading, and writing.
152. **Elementary German II (5). Pr., FL 151 or equivalent.**
A continuation of FL 151.
251. **Intermediate German I (5). Pr., FL 152 or equivalent.**
Provides the student with an understanding of the civilization of Germany while providing practice in reading, writing, and speaking the language.
252. **Intermediate German II (5). Pr., FL 251 or equivalent.**
German literature. Representative works of various German authors will be studied, with continuing practice in writing and speaking.

351. **Advanced German I (5). Pr., FL 252 or equivalent.**
Recognized works of German writers, with a review of German grammar and practice in composition.
352. **Advanced German II (5). Pr., FL 252 or equivalent.**
Recognized works of German writers. Emphasis on vocabulary building through composition.
451. **Contemporary German Literature I (5). Pr., FL 352 or equivalent.**
Selected readings in German literature of the nineteenth and twentieth centuries. Advanced practice in conversation.
452. **Contemporary German Literature II (5). Pr., FL 352 or equivalent.**
A continuation of 451.
453. **Survey of German Literature (5). Pr., FL 452 or departmental approval.**
The development of German literature from the beginnings through the Age of German Classicism (Schiller and Goethe).
454. **Survey of German Literature (5). Pr., FL 452 or departmental approval.**
A continuation of FL 453. The development of German literature from the Age of Romanticism to the present.
457. **Independent Work in German I (5). Pr., FL 453 or FL 454 or departmental approval.**
For the superior student majoring in German. A reading course to be completed with a term paper.
458. **Independent Work in German II (5). Pr., FL 453 or FL 454 or departmental approval.**
For the superior student majoring in German. A reading course to be completed with a term paper.

Italian

241. **Elementary Italian I (5). Pr., consent of instructor.**
The structure of the Italian language, with practice in speaking, reading, and writing.
242. **Elementary Italian II (5). Pr., FL 241 or equivalent.**
A continuation of FL 241.
341. **Intermediate Italian I (5). Pr., FL 242 or equivalent.**
The civilization and the literature of Italy while providing practice in reading, writing, and speaking Italian.

Portuguese

261. **Elementary Portuguese I (5). Pr., consent of instructor.**
The structure of the Brazilian language, with practice in speaking, reading, and writing.
262. **Elementary Portuguese II (5). Pr., FL 261 or equivalent.**
A continuation of FL 261.
361. **Intermediate Portuguese I (5). Pr., FL 262 or equivalent.**
Brazilian civilization and Luso-Brazilian literature.

Russian

171. **Elementary Russian I (5).**
The Russian language, with practice in reading, speaking, and writing.
172. **Elementary Russian II (5). Pr., FL 171 or equivalent.**
A continuation of FL 171.
271. **Intermediate Russian I (5). Pr., FL 172 or equivalent.**
Graded reading in Russian for vocabulary building and oral practice.
272. **Intermediate Russian II (5). Pr., FL 271 or equivalent.**
Readings in Russian civilization and oral practice in use of the language.
371. **Advanced Russian I (5). Pr., FL 272 or equivalent.**
Readings in Contemporary Russian literature, grammar review and oral practice.
372. **Advanced Russian II (5). Pr., FL 371 or equivalent.**
A continuation of FL 371.

GRADUATE COURSES

601. **Linguistic Science (5). Pr., consent of instructor.**
The various aspects and areas of linguistic study, including an examination of language distribution, relationships, types, changes, and development, and a brief introduction to phonetic structure, grammatical forms, and syntax.
603. **Romance Linguistics (5). Pr., consent of instructor.**
The development of Latin into the medieval and modern forms of the Romance languages, involving a comparison of Classical Latin with Early and Vulgar Latin and the main changes in phonology, morphology, and syntax of the latter into Italian, Spanish, Portuguese, French, and Roumanian. Some attention will be given to the history of Rome, of the Empire, and of the Celtic, Germanic, and Moorish invasions.

605. **Indo-European Linguistics (5). Pr., consent of instructor.**
Historical linguistics involving the reconstruction of proto Indo-European and the reflexes in the dialects, especially Latin, Greek, Sanskrit, and Gothic.
631. **Old Spanish Language and Literature (5).**
The internal and external history of the language together with readings from the *Poema del mio Cid*, Gonzalo de Berceo, Juan Ruiz, and Alfonso el Sabio. The role of the Ligurians, Iberians, Carthaginians, Greeks, Celts, Romans, Vandals, Visigoths, and Moors in the history of Spain and the Spanish language will be examined.
632. **Spanish Prose Fiction to 1700 (5).**
Development of early prose fiction through the Siglo de Oro, with special emphasis on the works of Cervantes.
633. **Spanish Prose Fiction Since 1700 (5).**
The continuing development of fiction from the eighteenth century to modern times, with special attention to the novel of the twentieth century.
634. **Spanish Drama to 1700 (5).**
Development of the drama through the Siglo de Oro, with emphasis on the chief works of Lope de Vega, Calderon, Tirso de Molina, and Ruiz de Alarcon.
635. **Spanish Drama Since 1700 (5).**
The continuing development of the drama through the Decadencia, Romanticismo, Siglo XIX, Generacion de '98, Modernismo, and the Posguerra.
636. **Poetry of Spain (5).**
The development of poetic forms, of the leading movements and principal poets, from the earliest *jarchas* to the contemporary.
637. **Spanish American Literature (5).**
A broad survey of the principal literary works of Spanish America from 1500 to the present.
638. **Spanish Bibliography (5).**
An intensive examination of the principal sources, collections, texts, histories, dictionaries, and reference works, useful to the Spanish scholar.
699. **Research and Thesis (5).**

Forestry (FY)*

Professors DeVal, Head, Christen, Hodgkins, and Johnson
Associate Professors Beals, Larsen, Posey, and Somberg
Assistant Professor DeBrunner

104. **Forest Cartography (3). Lec. 1, Lab. 6. Pr., MH 160.**
Use of drafting instruments in the construction of grids and planimetric and topographic maps; use of staff compass, tape, and plane table in map control and detail compilation; mapping accuracy requirements; engineering lettering; and map design.
105. **Forestry Convocation (0). Fall, Winter, Spring.**
A semi-quarterly forum required of all forestry students except in summer quarters. Visiting lecturers from all segments of federal, state, and private forestry will discuss topics of importance to the forest economy and interest to students.
201. **Dendrology (5). Lec. 3, Lab. 6. Fall. Pr., BI 102, or permission of instructor.**
Taxonomy and identification of the important forest trees of the United States and Canada. The major natural species groups, their geographic distribution and their typical site occurrence are outlined.
203. **Silvics I (5). Lec. 4, Lab. 3. Winter. Pr., BI 102, CH 104.**
Relationships between site factors and the internal structure, metabolism and growth of individual trees.
204. **Forest Mensuration (5). Lec. 3, Lab. 6. Spring. Pr., FY 104, FY 201.**
Measurement theory; methods and equipment used in measuring trees and stands; units of measure used in forestry; log rules and volume tables; condition class mapping; elementary timber estimating; stand and stock tables.
205. **Wood Identification and Uses (3). Lec. 1, Lab. 4. Fall, Spring.**
Identification of the commercial woods of the United States by macroscopic features, elementary wood anatomy, sufficient to permit an understanding of wood properties and the suitability of certain woods for specific uses. Introduction to the major uses of wood and the basic principles of lumber grading.
206. **Wood Measurements (3). Lec. 2, Lab. 3. Spring. Pr., MH 160 or equivalent.**
Wood measurements oriented toward the needs of students in wood technology.
207. **Silvics II (5). Lec. 3, Lab. 6. Spring. Pr., AY 305, FY 201, FY 203.**
Effects of site, competition and cultural practices on the establishment, development and yield of forest stands. Reciprocal effects of forest cover on the site.

*The prerequisites may be waived, by permission of the instructor concerned, for junior and senior students in other departments.

210. **Wood and Art (1). Lab. 2.**
The student will be introduced to wood terminology and to the use of wood in art forms in comparison with metal and stone. The unique properties of selected species will be studied.
302. **Forest Fire Control and Use (3). Lec. 2, Lab. 3. Winter. Pr., FY 207 and junior standing.**
Forest fire protection. Use of fire as a silvicultural tool. Public relations problems. Extended field trips will be made.
303. **Forest Recreation (3). Lec. 1, Lab. 6. Summer.**
Planning and administration of recreation in forest land management. Extended field trips will be made.
309. **Sampling (5). Lec. 4, Lab. 3. Winter. Pr., MH 162 or consent of instructor.**
Basic statistical and sampling concepts and procedures as applied to forestry problems.
310. **Advanced Mensuration (3). Lec. 2, Lab. 3. Spring. Pr., FY 204, FY 309.**
Statistical decision theory. Stratified sampling, including testing for effectiveness of stratification, allocation of the sample, and sample size. Inventories with probability proportional to size (point sampling). Forest growth and yield. Nature and use of yield tables. Stand projection methods. Growth percent.
311. **Wood Anatomy (5). Lec. 3, Lab. 6. Fall. Pr., FY 205.**
Identification of commercial woods of industry by microscopic features. Comparative anatomy and phylogenetic relationships. Introduction to microtechnique and maceration techniques.
313. **Farm Forestry (5). Lec. 4, Lab. 2. Fall, Winter. Pr., sophomore standing.**
(Not open to students in the degree Forestry curricula.) The place of farm forests in agricultural economy. The application of forestry principles to the problems of the farm woodland, especially as they relate to Alabama conditions.
330. **Forest Products (5). Lec. 3, Lab. 6. Fall. Pr., FY 205 or FY 311.**
Specifications, grading and manufacture of wood products derived from forest lands, including an introduction to pulp and paper manufacture and other chemical and mechanical processes utilizing wood.
370. **Wood as an Art Medium (3). Lec. 1, Lab. 4. Winter. For students majoring in the Fine Arts.**
Basic technology and properties of wood as applied to its use as an art medium. Wood identification, design of wood forms, and effect of moisture on the dimensional stability of wood. Design problems involving wood.
390. **Field Mensuration (5). Lec. 2, Lab. 9. Summer. Pr., FY 310.**
Application of the forest measurement principles to field conditions. Practical experience in forest inventory work on large properties.
391. **Forest Engineering (5). Lec. 2, Lab. 9. Summer. Pr., FY 104.**
Application of the principles of civil engineering to forest field conditions. Practical experience in road location, land surveying, and topographic surveying for recreational purposes.
396. **Forest Site Evaluation (2). Lec. 1, Lab. 3. Spring. Pr., GL 102, FY 207 and junior standing.**
Theoretical and field training in the classification and evaluation of forest habitats and land for various uses. Overnight field trips are required.
397. **Forest Regeneration (3). Lec. 1, Lab. 6. Summer. Pr., FY 207.**
Field observation and evaluation of natural and artificial methods of regeneration of forest types, with emphasis on ecological factors. Extended field trips will be made.
398. **Forestry Tour (1). Lab. 3. Summer. Offered only under the "Satisfactory/Unsatisfactory" option.**
A one-week tour to points of outstanding interest to foresters.
407. **Forest Management (5). Lec. 5. Spring. Pr., FY 420, FY 438 and junior standing.**
General principles applicable to the organization, administration and regulation of forest properties primarily for the production of crops of timber.
408. **Logging (3). Lec. 2, Lab. 3. Fall. Pr., FY 204.**
Logging methods and the factors affecting the costs in each phase of logging. Field practice given in the safe use of mechanical logging equipment.
413. **Microtechnique of Hard Materials (5). Lec. 1, Lab. 12. Pr., FY 311 or permission of instructor and junior standing.**
Preparation and sectioning of hard materials for microscopic study. Care and use of the sliding microtome and diamond saw, staining, counterstaining, and mounting of section.
415. **Range Management (2). Lec. 2. Fall. Pr., FY 207 or BY 413, and junior standing.**
Survey of range management as applied to forest properties.
417. **Photogrammetry (5). Lec. 3, Lab. 6. Spring. Pr., FY 310 or consent of instructor and junior standing.**
Use of aerial photographs in Forestry. Particular emphasis is placed on specifications for forestry photographs, basic map control, planimetric mapping, form-line mapping, timber type mapping and timber volume estimation.

GRADUATE COURSES

420. **Silviculture (5).** Lec. 3, Lab. 6. Fall. Pr., FY 207 or BY 413 and junior standing. Methods of controlling establishment, composition, growth, and quality of forest stands. Overnight field trips, not to exceed three, will be required.
421. **Forest Research Methods (3).** Lec. 2, Lab. 3. Winter and Spring. Pr., FY 309 or MH 163 and junior standing. Review of statistical and sampling methods. Experimental design and analysis of data.
425. **Wood Gluing and Lamination (5).** Lec. 3, Lab. 6. Winter. Coreq., FY 311; Pr., PS 205 and junior standing. Types and characteristics of woodworking glues. The theory, design, and manufacture of laminates and other glued products. The student will be introduced to research techniques and procedures by pursuing a specific study that will culminate in a comprehensive report.
431. **Mechanical Properties of Wood (5).** Lec. 3, Lab. 6. Spring. Pr., junior standing. Mechanical properties of wood, factors affecting the strength of wood, principles used in the design of wood structures. Testing procedures.
432. **Seasoning and Preservation of Wood (5).** Lec. 5. Winter. Pr., FY 311 and junior standing. Principles and practices of seasoning and impregnation of wood, study of wood destroying agencies.
433. **Seasoning and Preservation Laboratory (2).** Lab. 6. Spring. Pr., FY 432 and junior standing. Required for wood technology majors only. Laboratory study of techniques and equipment used in the seasoning and impregnation of wood.
434. **Forest Policy and Law (3).** Lec. 3. Spring. Pr., junior standing. Development of forest policy in the United States against the background of cultural heritages and economic situations. Forest Laws, National and State, as influenced by and as influencing policy.
435. **Forest Products Marketing (3).** Lec. 2, Lab. 3. Winter. Pr., FY 204, FY 205 and junior standing. An introduction to the forest products available for sale from large forest properties, the marketing channels through which they move, their comparative prices and production costs, and their measurement.
436. **Forest Watershed Management (3).** Lec. 2, Lab. 3. Winter. Pr., GL 102 and FY 203, AY 304, or AY 305 and BY 413; junior standing. A survey of forest hydrology as a specialized branch of forest ecology. The use of forests and forestry practices for the regulation of streamflow. An overnight field trip is required.
437. **Forest Economics I (3).** Fall. Pr., AS 202 or EC 200, and junior standing. Fundamentals of economics as applied to forestry. Supply, demand and price relationships; predictions for the future. Marginal analysis as applied to forestry enterprises. Bases and methods of forest valuation in the determination of stumpage, damages, alternatives and land. Taxes, their valuation and effect upon forest properties. Insurance and credit in forest ventures.
438. **Forest Economics II (3).** Winter. Pr., FY 437 and junior standing. Input-output relationships in forest production. Computation of financial maturity of trees and stands. Competition for resources in the management of forest properties. Uses of land and evaluation of intangible values associated with land.
450. **Small Woodland Management (5).** Summer. For majors in Education or Agricultural Education, by consent of instructor, and junior standing. The importance of small forest holdings in the national, regional, and state economies. An evaluation of trends in ownership patterns and their related problems. Characteristics used in recognition of forest stands comprising major forest types. Principles of forest management and their application.
460. **Wildland Recreation Philosophy and Policy (3).** Spring. An examination of the philosophy and policy of wildland recreation. Laws and traditions at federal, state, and local levels of government as well as industrial and other landowners' outlooks and developments relative to wildland recreation will be discussed.
461. **Recreational Land Classification (3).** Lec. 1, Lab. 6. Spring. Pr., FY 460. Land classification for various recreational uses will be reviewed and discussed from an economic viewpoint. Extended field trips will be required.
469. **Recreational Site Management (3).** Spring. Pr., FY 461, Coreq., FY 407. Management of recreational sites so as to take into account all of the resources of the land as well as the human and economic forces influencing that management will be examined.
480. **Senior Thesis (5).** Pr., senior standing. A problem in the student's area of interest. Will test ability of student to do thorough library research as well as any needed laboratory or field work. A comprehensive report, written in the style of a graduate thesis, is required.
490. **Seminar in Forestry (1).** Spring. Pr., senior standing. Advanced study of current literature and recent developments, with written and verbal reports on selected problems. Required of all graduate students in forest management and wood technology and all seniors in the Honors Program.

495. **Forestry Problems (1-5 each).** Pr., junior standing, permission of instructor, and approval of department head. Maximum of 10 hours in all areas as credit toward the Bachelor of Science degree. Areas of study defined as in FY 691.
601. **Wood Chemistry (5).** Lec. 2, Lab. 9. Pr., FY 430, CH 203.
Detailed study of the physical and chemical nature of cellulose and modified cellulose and their derivatives. Study of the lignocellulose complex. The chemical analysis of wood.
610. **Forest Tree Improvement (5).** Lec. 4, Lab. 3. Pr., ZY 300 or consent of instructor.
Principles of heredity as applied to forest trees and their management. Review of current knowledge in tree improvement. Principles of forest tree breeding. Study and evaluation of activities designed to produce genetically improved trees.
611. **Forest Soils (5).** Lec. 3, Lab. 6. Pr., AY 304 or AY 305.
Importance of morphological, physical and chemical properties of forest soils in relation to growth of trees. Classification of forest soils on the basis of productivity. Special emphasis on forest soils in the southern pine region.
613. **Forest Community Investigations (5).** Lec. 2, Lab. 8. Pr., GI 102, or AY 304 or AY 305; FY 207 or BY 413.
Methods of detecting, measuring, describing and analyzing forest communities and community types. Application to the study of forest ecosystems.
617. **Remote Sensing (3).** Lec. 2, Lab. 3. Pr., PS 206 or PS 221, and BY 413 or equivalent, or permission of instructor.
Spectral regions. Reflectance and emission of electro-magnetic energy. Types of remote sensing systems, including: photographic, in the visible and infrared spectral regions; line-scanning in the visible, infrared, and microwave spectral regions; and radar. The applications of remote sensing imagery to non-urban land management.
691. **Directed Study (1-5).** All quarters. Directed Study limited to a maximum of 5 hours in any specified area and to a maximum of 15 hours in all areas as credit towards the Master of Science degree.
Areas of Directed Study: (A) Forest Management, (B) Forest Economics, (C) Forest Sampling, (D) Regression Analysis, (E) Linear Programming, (F) Forest Photogrammetry, (G) Forest Mensuration, (H) Forest Engineering, (I) Forest Soils, (J) Forest Ecology, (K) Forest Genetics, (L) Tree Physiology, (M) Wood Anatomy & Quality, (N) Uses of Wood & Derived Products, (O) Chemistry of Wood Glues, Finishes, & Impregnants, (P) Timber Physics, (Q) Recreation, and (R) Remote Sensing.
695. **Special Problems (3-8).** All quarters.
A special problem in forestry or wood utilization. Such a problem will be of lesser magnitude than a thesis but will test the student's ability to do thorough library research as well as any needed laboratory or field work, and to prepare a comprehensive report on his findings. The work may be spread over more than one quarter, but shall be limited to a total of eight quarter hours.
699. **Research and Thesis.** Credit to be arranged.
799. **Research and Dissertation.** Credit to be arranged.

Foundations of Education (FED)

Professors Hollaway, Phillips, and Willers

Associate Professors Robison, Head, Fick, Greenshields, and Lauderdale

Assistant Professors Hatcher, Littleford and Schuessler

Instructors Deese, Easley, Guthery, McCullers, Spencer, and Wilmoth

Undergraduate

213. **Human Growth and Development (5).** Lec. 4, Lab. 2. Pr., sophomore standing. Required of all students completing the Teacher Education Program.
Analysis of the function of the teacher and the school in the direction, measurement, and evaluation of individual growth and development by using various sociological, philosophical, and psychological theories. Laboratory experiences provided.
214. **Psychological Foundations of Education (5).** Lec. 4, Lab. 2. Pr., sophomore standing, FED 213 or equivalent. Required of all students completing the Teacher Education Program.
The psychological dimensions of the educational process. The processes, conditions, and evaluation of learning, and related methodologies of teaching. Laboratory experiences and evaluation of the Pre-teaching Field Experience. For description of the Pre-teaching Field Experience Program, see Professional Requirements, Sect. C under School of Education.
320. **Social Foundations of Education (5).** Lec. 4, Lab. 2. Pr., junior standing, FED 214; SY 201 or equivalent and 5 additional hours of Social Science. Required of all students completing the Teacher Education Program.
Analysis of the social roles of the school in American culture, the influence of the school and the teaching profession on other institutions, and the social forces and crucial issues which affect education. Laboratory experiences and evaluation of the Pre-teaching Field Experience. For description of the Pre-teaching Field Experience Program, see Professional Requirements, Sect. C under School of Education.

480. **Philosophical Foundations of Education (5).** Pr., senior standing, FED 320 or equivalent, professional internship or approval of adviser(s). Required of all students completing the Teacher Education Program.
The development of educational movements and ideas in Western culture which influence modern educational practices. Evaluation of laboratory experiences and the Professional Internship through philosophical analysis of educational concepts and problems.
490. **Evaluation in Education (3).** Lec. 2, Lab. 2. Pr., senior standing.
Analysis of methods, procedures, and evaluative instruments for determining teaching effectiveness and the attainment of educational goals. Examination of theories and methods of testing, measurement, self-evaluation, and pupil accounting. Techniques, uses and interpretation of educational statistics. Laboratory experiences in the public schools.

Advanced Undergraduate and Graduate

420. **Educational Sociology (5).** Pr., junior standing, FED 320 and SY 201 or equivalents.
Analysis of the school as a social institution. Group interaction, formal and informal structure and organization, and the relationship of education to other social institutions.
434. **Personality Dynamics and Effective Behavior (5).** Pr., junior standing and ten hours of psychology.
Analysis of adaptive and maladaptive behavior. Not open to students majoring in psychology.

Graduate

600. **Education in Modern Society (5).** Pr., graduate standing.
Analysis and interpretation of the interaction of historical, philosophical and sociological considerations affecting education in modern society.
601. **Social Foundations of Education (5).** Pr., FED 600.
Analysis of man as a social being, his social relationships and inventions, and value patterns. Directions and support of educational developments in relation to various socioeconomic structures.
602. **Social Change and Educational Development (5).** Pr., FED 601.
Major current theories of social change and their practical application in improving the school and directing social innovations which sustain educational improvements.
617. **Advanced Educational Psychology (5).** Pr., FED 213 and 214 or equivalents. (Not open to students with credit in FED 451.)
In-depth analyses of the psychological bases of learning. Particular emphases are the development and modification of cognitive and affective behavior.
625. **Urbanization and Educational Development (5).** Pr., FED 600.
Developments in the concentration of population, wealth, and cultural dissemination in urban areas. The changing character of this concentration, and its impact on educational agencies regarding different population groups and different areas of educational service.
630. **Education and Culturally Disadvantaged People in America (5).** Pr., FED 600.
Areas and extent of cultural disadvantage and its relation to education. Shifting concentrations of disadvantage in relation to patterns of population growth and cultural development. Educational aims and procedures in preventing and remedying cultural disadvantage.
634. **History of Education (5).** Pr., FED 600.
The emergence of education as a formal institution, tracing its historical development from early Greek times to the present and emphasizing the historical antecedents which have helped to shape the role and functions of education in Western culture.
636. **Philosophy of Education in America (5).** Pr., FED 600.
Major American contributions to the philosophy of education and their influence on educational practice. Need for, and procedures in, reexamining concepts in the light of recent scientific and cultural developments.
637. **Development and Status of Educational Philosophy (5).** Pr., FED 600; FED 636 or consent of department head.
Development of philosophy of education from the standpoint of its implications for educational practice. Several patterns of thought are considered including supernaturalism, idealism, realism, humanism, communism, existentialism, and experimentalism.
639. **Comparative Education (5).** Pr., FED 600; two quarters of graduate study or consent of department head.
Comparison among the educational systems of leading foreign countries and the United States, giving attention to the historic origins of different systems and to their present sociological and philosophical significance.
645. **Current Problems and Issues in the Foundations of Education (5).** Pr., teaching experience.
Interpretation of selected issues in the sociological, psychological, historical and philosophical foundations of education which affect the total educational enterprise and its relation to society.

646. **Studies in Education (1-3). Pr., one quarter of graduate study. May be repeated for credit not to exceed 3 hours.**
Study of a problem using research techniques to be selected in consultation with the supervising professor. A problem should be selected which will contribute to the program of the student. (Credit in ED 651 prior to 1960 excludes credit in this course.)
647. **Foundations in Curriculum and Teaching (5).**
Development of curriculum patterns and teaching materials reviewed in terms of recent investigations and experimentation; conflicting conceptions of the nature of the curriculum and the sociological, philosophical and psychological implications of these conflicts; methods of curricular reorganization in the elementary and secondary schools.
650. **Seminar in Foundations of Education (3-10). May be repeated for credit not to exceed 10 hours.**
Consideration of historical, philosophical, sociological, psychological, and research issues and their impact on education.
661. **Research and Experimentation in Education (5).**
Emphasis given to research methods, design of experiments, and evaluation; data sources, research planning, elements of scientific method and proposal writing. Current trends in educational research.
672. **Statistical Methods in Education (5).**
The need and importance of applying statistical methods to the study of educational problems, statistical methods appropriate to education, and interpretation of meanings of statistical analyses.
673. **Research and Experimental Design (5). Pr., FED 672.**
Relationship of design to validity; significance of variables, testing hypotheses, evaluation of research and research findings.
675. **Advanced Statistical Methods in Education (5). Pr., FED 672.**
Analysis of variance and covariance; correlation analysis and linear regression. Simple and complex factorial designs applied to educational research.
676. **Advanced Research and Experimental Design (5). Pr., FED 675.**
An extensive examination of the nature and character of experimental design in educational research including the development of appropriate analytical techniques.

Geology (GL)

Professor Carrington, *Head*
Associate Professor DeRatmiroff
Assistant Professor Christopher
Instructor Taylor

101. **Introductory Geology I (5). Lec. 4, Lab. 2. All quarters.**
The origin and classification of rock-forming and ore minerals. Sedimentary, metamorphic, and igneous processes, and classification of rocks that result from such processes. Rock deformation and mountain building.
102. **Introductory Geology II (5). Lec. 4, Lab. 2. All quarters.**
Geomorphology through study of weathering, mass movement, formation of soils, and the erosional, transportational, and depositional aspects of groundwater, streams, oceans, glaciers, and wind.
201. **Geological Field Methods (2). Lab. 5. Winter. Pr., GL 101 or 102.**
The instruments and methods used in geological field mapping.
301. **Mineralogy I (5). Lec. 4, Lab. 2. Fall. Pr., CH 103 or equivalent.**
Crystal chemistry and crystallography.
302. **Mineralogy II (5). Lec. 4, Lab. 2. Winter. Pr., GL 301.**
Identification, description, and classification of representative minerals and mineraloids.
310. **Geologic History of Life (5). Lec. 4, Lab. 2. Fall. Pr., BI 101 or consent of instructor.**
A survey of the major groups of plants and animals as they are found in the fossil record. Basic principles and techniques of paleontology will also be considered: fossilization, speciation, evolution, paleoecology, paleogeography.
311. **Invertebrate Paleozoology (5). Lec. 4, Lab. 2. Winter. Pr., GL 310 or BI 103 or equivalent.**
Morphology, classification, and significance of selected genera representative of the diversity of fossil invertebrates, including microscopic fossils.
312. **Paleobotany (5). Lec. 4, Lab. 2. Spring. Pr., GL 310 or BI 102 or equivalent.**
Morphology, anatomy, evolution, and stratigraphy of fossil plants, including microscopic fossils.
401. **Sedimentation-Sedimentary Petrology (5). Lec. 4, Lab. 2. Fall. Pr., GL 302 and GL 310 or consent of instructor.**
Principles involving transportation and deposition of marine and non-marine sediments, and detailed description and classification of rocks that result from such processes.

- 402. Structural and Geotectonic Principles (5).** Lec. 4, Lab. 2. Winter. Pr., GL 201 or consent of instructor.
Principles and processes of rock deformation, emphasizing description and classification of geologic structures that result from deformative forces. History of structural development of North America, particularly the eastern and southeastern United States.
- 403. Igneous and Metamorphic Petrology (5).** Lec. 4, Lab. 2. Spring. Pr., GL 302.
Principles and processes of intrusive and extrusive igneous activity and metamorphism. Description of classification of igneous metamorphic rocks.
- 411. Stratigraphy (5).** Lec. 4, Lab. 2. Spring. Pr., GL 310, GL 401, and GL 402.
Descriptive geology pertaining to the discrimination, character, thickness, sequence, age, and correlation of rocks. Particular emphasis on field study of stratified rocks, and on the physical development and history of North America as recorded in the stratigraphic record.
- 421. Economic Geology I (5).** Lec. 4, Lab. 2. Fall. Pr., GL 402, 403.
The origin and classification of mineral deposits formed by igneous and metamorphic activity. Introduction to methods of prospecting.
- 422. Economic Geology II (5).** Lec. 4, Lab. 2. Spring. Pr., GL 401.
The origin and classification of mineral deposits formed by surficial processes. Introduction to methods of prospecting.
- 431. Research Methods and Application (1-6).** All quarters. Pr., senior majoring in geology, and/or consent of departmental faculty upon receipt of acceptable proposal.
Active participation in some phase of original research under supervision of a senior investigator. Credit evaluation determined by the departmental faculty on the basis of the formal presentation of the problem and the probable method(s) of investigation. May be taken more than one quarter for a maximum cumulative credit of six credit hours.

Health, Physical Education and Recreation (HPR)

Professors Fourier, Head, Francis, Land, Means, and Umbach
Associate Professors Fitzpatrick, Puckett, Turner, and Young
Assistant Professors Bengtson, Dragoin, Ford, Morgan, Martincic,
Moore, Rosen, Waldrop, and Washington
Instructors Barrington, Bond, Bridges, Cherellia, Lane, McCampbell,
Moore, and Smith

The instructional program of the Department of Health, Physical Education and Recreation comprises (1) courses in health and physical education for students in the University liberal education program; (2) course for students majoring or minoring in health education, physical education, and recreation administration; and (3) courses for students in preparation for teaching.

University Physical Education Requirements

Three quarters of physical education are required by the University for graduation. Any deficiencies in physical education incurred at Auburn University or elsewhere must be cleared prior to graduation. Only one credit per quarter is permitted or transferable to meet the three-quarter requirement.

Health Classification. Each student is assigned a health classification of "A", "B", or "C" and is issued a health card which identifies courses for which he is eligible. The "A" classification is assigned to students who are free from health problems; the "B" classification is assigned to students who may be restricted from participating in certain phases of the program; the "C" classification is assigned to students who are restricted from participating in any vigorous physical activity. Students may request re-classification whenever changes in health status or physical condition occur.

Course Requirements. Students with an "A" health classification are required to take PEM or PEW 101, Foundations of Physical Education, during their first quarter of physical education. Those who do not have sufficient skill in swimming to assure their own safety in and around water are required to take PEM or PEW 102, Beginning Swimming (Department of Health, Physical Education, and Recreation administers a test to determine each student's swimming ability.) Students who take swimming choose one course from Group I or II listed below for their third quarter's work. Students who do not take a swimming course must select one course from Group I and one course from Group II in completing their three quarters of physical education.

Students with "B" or "C" classifications are required to take either PEM or PEW 101, Foundations of Physical Education, or PEM or PEW 100, Foundations of Physical Education for the Atypical as marked on their health cards. During subsequent quarters they are expected to meet the other requirements stated above as nearly as medical restrictions will allow. Specific course selection should be made on the recommendations of the Department of Health, Physical Education and Recreation.

Full participation in the Band should substitute for one of the three required quarters. Band members should complete the last two-thirds of the Physical Education sequence; swimming and one other course.

Students with six months to one year military service receive credit for PEM 101, more than one year of service are exempted from all Physical Education requirements with one exception; swimming should be completed unless the student passes the departmental proficiency test.

The extent of participation in the required Physical Education program for students over 26 years of age should be judged by their Academic Deans; unless all or part of the requirement is waived by the Dean, these students should enroll for the last two-thirds of the required sequence.

Varsity athletics scheduled in season for three quarters satisfies the three quarters requirements. Each should pass the departmental proficiency swimming test or enroll in PE 102 Beginning Swimming.

Credit. All courses carry one hour credit per quarter (maximum of six quarter hours allowed on degree). No student may receive credit for a course in which he has previously earned credit.

Students may not register for a beginning level course (Groups I and II) after having earned credit in the sport or dance area on an advanced level (Group III). Credit cannot be earned for a 200 and a 300 level course in the same sport.

Electives. Three quarter hours credit may be earned in addition to the three quarter hours required. Elective courses may be chosen from Groups I, II, and III.

100. Foundations of Physical Education for the Atypical (I).

Designed for the individual with anatomical and functional defects.

101. Foundations of Physical Education (I).

Understanding the relationship of human movement to body efficiency, aesthetics and health; self-appraisal; development of a personal plan for achieving and maintaining physical condition; selection of a personal program of developmental and recreational activities.

102. Beginning Swimming (I).

Knowledge and skill in aquatics which are developed to a level sufficient to support a recreational interest and to assure one's own safety and the safety of others in and around water.

103. Swimming for the Atypical (I).

Provides water therapy, an understanding of adaptive movements, and aquatic skills.

107. Sports and Dance in American Culture (I). (Atypical).

114. Recreational Sports for the Atypical (I).

Survey of recreational pursuits for students with physical limitations: billiards, bicycling, croquet, darts, hiking, horseshoes, net games, and shuffleboard.

115. Adapted Physical Education (I).

Concerned with the improvement and correction of physiological and anatomical remedial defects.

Group I (Vigorous)*

116. Weight Control (I).

Caloric intake-output, nutrition, and the development of desirable exercise and nutritional habits. Activities selected according to individual needs and limitations. Open to students with health classifications "A", "B", and "C".

125. Basketball (I).

126. Touch Football (I).

127. Soccer-Speedball (I).

130. Boxing (I).

131. Fencing (I).

132. Wrestling (I).

*Vigorous activities having special value with respect to development and maintenance of physical condition.

- 134. **Judo (1).**
- 135. **Weight Training (1).**
- 136. **Track (1).**
- 137. **Handball (1).**
- 140. **Apparatus (1).**
Understanding of gymnastics and skill in the use of different apparatus.
- 141. **Trampoline (1).**
- 142. **Tumbling (1).**
- 145. **Contemporary Dance (1).**
An understanding of dance as an art form.
- 146. **Tap Dance (1).**
- 147. **Ballet (1).**
Fundamentals and terminology of classical ballet.

Group II (Recreational Skills)**

- 150. **Intermediate Swimming (1).**
- 153. **Springboard Diving (1).** Lab. 3. Pr., classified as intermediate swimmer or above.
Instruction in the basic dives; front, back, inward, reverse, and twist.
- 155. **Angling (1).**
Skills in bait and fly casting. Selection and care of tackle.
- 156. **Archery (1).**
- 157. **Badminton (1).**
- 158. **Bowling (1).**
- 159. **Golf (1).**
- 162. **Rifle Marksmanship (1).**
Open to students in Air, Army and Navy ROTC.
- 163. **Tennis (1).**
- 165. **Camping (1).**
Understanding of American heritage in relation to the out-of-doors, camping trends, conservation, and the development of camping skills.
- 166. **Family Recreation (1).**
Leisure time activities suitable for the family.
- 168. **Basic Equitation (1).**
- 170. **Folk Dance (1).**
- 172. **Social Dance (1).**
Mixers, as well as ballroom dancers: foxtrot, waltz, rhumba, tango, and other representative Latin dances.
- 180. **Softball (1).**
- 181. **Volleyball (1).**

Group III (Advanced — Elective)

- 250. **Synchronized Swimming (1).**
A creative approach to individual and group composition of water ballet stunts and stroke adaptations.
- 251. **Life Saving (1).**
Skills leading to certification in Red Cross Senior Life Saving.
- 255. **Skin Diving (1).** Lec. 1, Lab. 2. Pr., classified as advanced swimmer.
Underwater swimming. Includes selection and use of swim fins, mask, and snorkel. Underwater physiology and safety are emphasized.
- 259. **Advanced Golf (1).**
- 263. **Advanced Tennis (1).**
- 325. **Varsity Basketball (1).**
- 326. **Varsity Football (1).**
- 332. **Varsity Wrestling (1).**
- 336. **Varsity Track (1).**
- 337. **Varsity Cross Country (1).**
- 340. **Competitive and Exhibitional Gymnastics (1).**
- 350. **Varsity Swimming (1).**

**Activities having special value as healthful, lifetime recreational pursuits.

- 359. Varsity Golf (1).
- 363. Varsity Tennis (1).
- 380. Varsity Baseball (1).

Courses for the Major and the Minor

- 111-112-113. **Health Science (1-1-1).**
(111) Concepts related to health and college life, nutrition, maintaining the body, and consumer health choices; (112) mental health, stimulants and depressants, family living, and chronic-degenerative diseases; (113) community health problems, communicable diseases, and safety education.
- 117. **Developmental Activities: Theory and Techniques (2).** Lec. 1, Lab. 4.
Body mechanics, calisthenics, movement fundamentals, weight training.
- 118. **Compatives: Theory and Techniques (2).** Lec. 1, Lab. 4.
Boxing, fencing, and wrestling.
- 119. **Individual and Dual Sports: Theory and Techniques (2).** Lec. 1, Lab. 4.
Archery, badminton, bowling, golf, and tennis.
- 120. **Apparatus and Tumbling: Theory and Techniques (2).** Lec. 1, Lab. 4.
Apparatus, stunts, tumbling, pyramids, and trampoline.
- 121. **Aquatics: Theory and Techniques (2).** Lec. 1, Lab. 4.
Water sports, scuba diving, operation and maintenance of pools.
- 122. **Team Sports: Theory and Techniques (2).** Lec. 1, Lab. 4.
Basketball, field hockey, soccer, softball, speedball, and volleyball.
- 123. **Social and Folk Dance: Theory and Techniques (2).** Lec. 1, Lab. 4.
Basic skills, fundamental knowledge and appreciation of social and folk dance.
- 195. **Health Science (3).**
Basic understanding concerning sound health practices and protection. Physical, mental, and social aspects of personal and community health are considered.
- 201. **History and Principles of Health, Physical Education, and Recreation (3).**
A brief overview of significant ideas and events in the development of health education, physical education, and recreation.
- 202. **Basketball (Men) (3).** Lec. 2, Lab. 2. Fall.
The fundamental skill techniques of basketball—offense, defense, and strategy.
- 203. **Baseball (3).** Lec. 2, Lab. 2.
Offensive and defensive strategy, pitching, catching, infielding, outfielding, batting and baserunning.
- 204. **Track and Field (3).** Lec. 2, Lab. 2.
Fundamental skills and techniques of track and field athletics. The organizing and conducting of track meets.
- 206. **Football (Men).** Lec. 2, Lab. 2. Winter.
The fundamentals of football and the different types of offense, defensive team strategy and generalship.
- 207. **Conduct of Dance for High School and Recreation Programs (3).** Lec. 2, Lab. 2.
Providing experiences in analyzing, selecting and presenting dance for high school and recreation programs.
- 208. **Theory and Conduct of Team Sports for Women (3).** Lec. 2, Lab. 2.
Lead-up games, skill techniques, rules, and skill tests; practice and application of the skills and principles of team sports.
- 209. **Theory and Conduct of Individual and Dual Sports (3).** Lec. 2, Lab. 2.
Skills, techniques, rules, and skill tests; practice and application of the skills and principles of individual and dual sports.
- 210. **Theory and Conduct of Gymnastics (3).** Lec. 2, Lab. 2.
Skills and techniques for teaching apparatus, stunts, and tumbling.
- 211. **Sensorimotor Activities (3).** Lec. 2, Lab. 2.
Designed to develop understandings and skills concerning the broad concept of sensorimotor experiences for children, ages 4-8.
- 212. **Elementary School Activities (3).** Lec. 2, Lab. 2.
Physical education activities suitable for the first six grades including teaching devices.
- 213. **Dance for Children (3).** Lec. 2, Lab. 2.
Includes all forms of dance suitable for elementary school age children with emphasis on creative dance activities which afford a progression in dance skills.
- 225. **Basketball Officiating (1).** Lab. 3.
Discussions, practices, and leadership experiences.
- 226. **Softball Officiating (1).** Lab. 3.
Discussions, practices, and leadership experiences.
- 227. **Volleyball Officiating (1).** Lab. 3.
Discussions, practices, and leadership experiences.

295. **School and Community Health (3).**
Analysis of health practices in the school and community. Emphasis is given to the scope, purposes, philosophy, and principles pertaining to health in the school and community.
315. **Kinesiology (3). Lec. 5. Pr., VM 220-221, PS 204.**
316. **Evaluation in Health, Physical Education, and Recreation (3).**
351. **Water Safety (3). Lec. 1, Lab. 4. Pr., current Red Cross Sr. Life Saving Certificate.**
American Red Cross Advanced Swimmer and Water Safety Instructor courses leading to certification.
370. **Dance Survey (3). Lec. 2, Lab. 2.**
Explores styles and types of dance through the ages in relation to music, drama, architecture and art.
372. **Dance Production and Rhythmic Demonstrations (3). Lec. 2, Lab. 2.**
Apprenticeship in producing dance programs, exhibitions of physical activity and festivals.
385. **Principles of Recreation (3).**
The significance and meaning of leisure; theories of play; the recreation movement in the United States. Principles of program planning and development at state and local levels of government, in schools and in industry.
386. **Recreation Leadership (3).**
387. **Outdoor Recreation (3).**
Outdoor recreation in the United States. Includes principles of planning for recreational use of open land, forests, farms and water.
388. **Camp Management (3). Camp programs, duties and responsibilities of camp directors and counselors.**
395. **Health Instruction (3).**
Designed to prepare prospective elementary and secondary school teachers and health personnel for health education responsibilities. Organization and planning for instruction, teaching procedures, content, materials, and resources are examined and evaluated.
396. **Drug Use and Abuse (3).**
Investigation of stimulants and depressants with special emphasis on alcohol, narcotics, and tobacco. The effects of these substances on the human body and the social, economic, and community problems associated with their use.
401. **Organization and Administration of Health, Physical Education, and Recreation (5). Senior standing.**
Administration of health education, physical education, and recreation activities; construction and care of physical facilities; studies of departmental organization.
404. **Athletic Injuries (3).**
Athletic injuries as to care, prevention, and correction.
405. **Physiology of Muscular Activity (3). Pr., VM 220-221.**
Inter-relationships of muscular activity and physiological variations.
416. **Adaptive Physical Education (3). Lec. 3. Spring. Pr., PE 214, VM 220 and 221.**
Review of anatomy, physiology, and psychology pertaining to special programs of physical education for the temporarily and permanently handicapped, with laboratory practice in posture training and remedial gymnastics.
485. **Social Recreation (3). Planning social recreation experiences.**
495. **First Aid (3). Lec. 2, Lab. 2.**

Advanced Undergraduate and Graduate

409. **Advanced Health Science (5). Pr., permission of instructor and junior standing.**
Principles and concepts basic to the improvement of individual and group living and the role of the home, school, and community in the development of sound physical and mental health.
417. **Physical Education for the Mentally Retarded (5). Pr., junior standing.**
The motor characteristics of the mentally retarded and the design of special programs of physical education; involves working with mentally retarded children.
419. **Current Problems in Health Education (5). Pr., consent of instructor and junior standing.**
A critical analysis of the problems, issues, and trends in health education.
472. **Dance Concepts and Related Classroom Experiences (5). Pr., junior standing.**
An examination of learning situations that afford the individual an aesthetic and creative means of non-verbal communication through dance.
497. **Drug Abuse Education (5). Pr., consent of instructor and junior standing.**
Designed to provide a practical and working understanding and means of response to drugs and drug abuse problems to prospective and in-service teachers, counselors, administrators, pharmacists, law enforcement personnel, nurses and other. Interdisciplinary team instruction is utilized.

Graduate

619. **Scientific Principles Applied to Physical Education and Athletics (5).** Pr., undergraduate major or minor in health and physical education.
Specific application of physics, physiology, and psychology to the development of physical skills and related topics including reaction time, motivation, maturation, illusions, morale, and problems of group social living in physical education and athletics.
626. **Physical Fitness, a Critical Analysis (5).** Pr., VM 220-221 or permission of department head.
Critical analysis of physical fitness objective of physical education through inquiry into current research in medicine, physiology of muscular activity, and physical fitness appraisal and guidance.
669. **Physiology of Exercise (5).** Pr., undergraduate major or minor in health and physical education.
Experiences in the physiology of muscular activity and application of these to physical education and athletic situations.
699. **Thesis Research.** (Credit to be arranged.) May be taken more than one quarter.
798. **Field Project.** Credit to be arranged. May be taken more than one quarter.

Professional Courses

Undergraduate

104. **Orientation for Transfer Students (1).**
Helps transfers from other curricula to understand teacher education and teaching as a profession.
105. **Orientation for Freshmen (1).**
Helps freshmen in planning their professional careers.
108. **Orientation to Laboratory Experiences (1).**
Required of all students completing the Teacher Education Program. Orientation to the total laboratory experiences program in the School of Education with specific attention to the orientation and initiation of the pre-teaching field experiences program.
414. **Teaching in Health and Physical Education in Elementary and Secondary Schools (3).** Lec. 2, Lab. 2. Pr., FED 320 or equivalent.
(For description, see Interdepartmental Education.) (A) Health Education, (B) Health, Physical Education, & Recreation.
423. **Program in Area of Specialization (3).** Lec. 2, Lab. 2. Pr., FED 320 or equivalent.
(A) Health Education, (B) Health and Physical Education, and (C) Recreation Administration.
- Undergraduate students with a major in health, physical education and recreation will pursue a minor selected from some other teaching area in the secondary school program or in one of the areas included in the twelve-grade program. (For appropriate course in Teaching or Program, see SED, IED, and VED.)
425. **Professional Internship in Health, Physical Education, and Recreation (15).** Pr., senior standing. Admission to Teacher Education prior to Internship, minimum of two appropriate Teaching and Program courses.
(A) Health Education, (B) Health and Physical Education, (C) Recreation Administration. (Admission to Teacher Education does not apply for C).
496. **Problems of Health Education and Health Observation of School Children (5).** Pr., junior standing.
Helps the teacher with the details of health observation, aids in health guidance of individual pupils, acquaints the teacher with the health services available through local and state departments.

Graduate

The following courses are organized and taught on a twelve-grade basis:

646. **Studies in Education (1-3).** Pr., one quarter of graduate study. May be repeated for credit not to exceed 3 hours.
A problem using research techniques to be selected in consultation with the supervising professor. A problem should be selected which will contribute to the program of the student. (Credit in ED 651 prior to 1960 excludes credit in this course.)
- Each of these courses, HPR 651 and 652, applies to the following areas of the elementary and secondary school programs: (A) Health Education, and (B) Physical Education. Credit may not be earned in both A and B of the same course.
651. **Research Studies (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.
Review, analysis and interpretation of available research in health education or physical education with emphasis on designing new research to meet changing needs of the school.

652. **Curriculum and Teaching in Elementary and Secondary Schools (5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.**
Teaching practices and reappraisal of selecting experiences and content for curriculum improvement in health education or physical education.
653. **Organization of Program in Health and Physical Education in Elementary and Secondary Schools (2-5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.**
Advanced course. Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **Evaluation of Program in Health and Physical Education in Elementary and Secondary Schools (2-5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.**
Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of health and physical education with the total school program and with other educational programs of the community.

History (HY)

Professors McMillan, *Head*, Belser, Harrison, Lewis, Machl,
Owsley, Rea, and Williamson

Associate Professors Jones, Kendrick, Newton, Pidhainy, and Reagan

Assistant Professors Bond, Cronenberg, Eaves, Hall, and Henson

Instructors Fabel, Matthews*, and Olliff

101. **World History (3).**
A survey of world civilization from prehistory to 1400.
102. **World History (3).**
A survey of world civilization from 1400-1815.
103. **World History (3).**
A survey of world history from 1815 to the present.
201. **A History of the United States to 1865 (5).**
202. **A History of the United States Since 1865 (5).**
204. **Technology and Civilization I (3).**
The interaction of technology and other aspects of human culture from prehistoric times to the beginning of the industrial revolution.
205. **Technology and Civilization II (3).**
The interaction of technology and other aspects of human culture from the industrial revolution to the end of the nineteenth century.
206. **Technology and Civilization III (3).**
The interaction of technology and other aspects of human culture in the twentieth century.
300. **Introduction to Latin American History (5). Pr., sophomore standing.**
A survey of Latin American civilizations to the present with emphasis on the Colonial Period.
301. **Introduction to Far Eastern History (5). Pr., sophomore standing.**
A brief survey of the major cultural and institutional developments of the area.
306. **Contemporary History (3).**
A survey of recent events and their effect on the modern world.
311. **Medieval History (5). Pr., sophomore standing.**
Europe from the fall of the Roman Empire to the Age of Discovery.
315. **American Black History to 1900 (5). Pr., sophomore standing.**
Racial and cultural origins of the black, including African background, the slave trade, slavery in the New World, emergence of the free black, emancipation of the slaves, Reconstruction, and the evolution of the institution of segregation.
322. **The United States in World Affairs (3). General elective. Pr., sophomore standing.**
The influence which the United States has exerted in international affairs.
350. **History of Political Parties (5). Pr., sophomore standing.**
Emphasis is placed on the origin and growth of American political parties from the Federalist era to the present.
355. **History of the Iberian Peninsula (5).**
A survey of Spanish and Portuguese history from prehistoric to contemporary times.

*On temporary appointment.

371. **History of the West (5). Pr., sophomore standing.**
The development of the West and of its influence on American history.
381. **History of Alabama (5). Pr., sophomore standing.**
A brief history of Alabama from the beginning to the present.
400. **American Colonial History (5). Pr., junior standing.**
The political, economic, and social history of the colonies from their founding to the end of the French and Indian War, 1763.
401. **The American Revolution and the Confederation, 1763-1789 (5). Pr., junior standing.**
The new British Colonial policy, the War for Independence, and the first federal constitution and the movement to replace it.
402. **Federalist and Jeffersonian America, 1789-1815 (5). Pr., junior standing.**
The establishment of the new federal government, the origins of American political parties, and the role of the United States in the French Revolutionary and Napoleonic Wars.
403. **The American System and Jacksonian Democracy, 1815-1850 (5). Pr., junior standing.**
Nationalism, sectionalism, egalitarianism, and expansion.
404. **The Civil War (5). Pr., junior standing.**
The sectional controversy from the Compromise of 1850 to the beginning of hostilities in 1861, and the military, economic, social, and political aspects of the war.
405. **The Reconstruction Period (5). Pr., junior standing.**
An analysis of the social, economic, and political aspects of the years 1865-1877.
406. **United States History, 1877-1914 (5). Pr., junior standing.**
The political, economic, diplomatic, social, and cultural development of the United States.
407. **Recent United States History, 1914-1932 (5). Pr., junior standing.**
Political, economic, and social development of the United States.
408. **Modern America, 1932 to the Present (5). Pr., junior standing.**
Political, economic, and social development of the United States.
409. **United States Diplomacy to 1890 (5). Pr., junior standing.**
Chief events in our relationships with foreign powers from the Revolutionary War to 1890.
410. **United States Diplomacy Since 1890 (5). Pr., junior standing.**
The emergence of the United States from a hemispheric power to a total involvement in world affairs.
411. **Social and Intellectual History of the United States to 1876 (5). Pr., junior standing.**
Selected areas of American thought are studied in their social context, ranging from Puritanism to the impact of Darwinism on the American mind.
412. **Social and Intellectual History of the United States Since 1876 (5). Pr., junior standing.**
An examination of major intellectual movements in American society from social Darwinism to Progressivism and its legacy.
413. **The South to 1865 (5). Pr., junior standing.**
The origins and growth of distinctive social, economic, cultural, and ideological patterns in the South with emphasis on period 1815-1860.
414. **The South Since 1865 (5). Pr., junior standing.**
Major trends in the South since the Civil War with emphasis on social, economic, cultural, and ideological development.
415. **American Black History Since 1900 (5). Pr., junior standing.**
An analysis and interpretation of the role of American blacks in the development of the United States in the twentieth century.
426. **The Reformation Era, 1500-1600 (5). Pr., junior standing.**
Europe during the Protestant and Catholic Reformations, overseas discovery, and political developments in the age of Charles V, Henry VIII, Elizabeth, and Philip II.
427. **Seventeenth Century Europe (5). Pr., junior standing.**
Emphasis on the Thirty Years' War, Scientific Revolution, overseas colonization, and European political developments in the age of Louis XIV.
428. **Europe, 1715-1789 (5). Pr., junior standing.**
A history of Europe from the Age of Absolutism to the collapse of the Old Regime.
429. **The French Revolution, 1789-1799 (5). Pr., junior standing.**
Background; causes and course of the Revolution in France.
432. **The Genesis of Modern Germany (5). Pr., junior standing.**
A survey of the political, constitutional, and cultural history of Germany to 1740.
433. **Modern German History (5). Pr., junior standing.**
A general history of the German states since 1648.
435. **Napoleonic Europe, 1799-1815 (5). Pr., junior standing.**
The rise and fall of the Consulate and the Empire in France and French hegemony in Europe.

436. **Modern France (5). Pr., junior standing.**
From the Ancien Regime to the present.
443. **History of Europe, 1815-1871 (5). Pr., junior standing.**
European history from the Congress of Vienna through the unification of Germany and Italy.
444. **Europe, 1871-1919 (5). Pr., junior standing.**
Emphasis on Central Europe, Germany, and Italy since unification.
445. **Europe Since 1919 (5). Pr., junior standing.**
Emphasis on the rise of totalitarianism, the Second World War, and the post-war period.
450. **Eastern Asia (5). Pr., junior standing.**
A history of China and Japan in the modern world.
451. **South and Southeast Asia (5). Pr., junior standing.**
The diverse cultures of the Asian periphery emphasizing the impact of the West in the recent period.
452. **The Caribbean Area (5). Pr., junior standing.**
An analysis of the Caribbean as to its geographic, cultural, and strategic importance from 1492 to the present.
453. **South America to 1900 (5). Pr., junior standing.**
The colonial and early national period.
454. **History of Mexico (5). Pr., junior standing.**
An analysis of the unique cultural development of Mexico.
455. **Twentieth Century South America (5). Pr., junior standing.**
A survey of the conflict between tradition and change in a developing continent.
456. **History of Modern Russia, 1453-1917 (5). Pr., junior standing.**
A detailed history of the Russian nation in the modern era to the dissolution of the Empire.
457. **History of the Soviet Union Since 1917 (5). Pr., junior standing.**
The territories under the Bolshevik regime from the proclamation of the Bolshevik state to the present time.
460. **Great Leaders of History (5). Pr., junior standing.**
Some world leaders and their relationship to the great movements of history.
471. **History of Medieval England (5). Pr., junior standing.**
A survey of English origins and institutions to the seventeenth century.
472. **History of Modern England (5). Pr., junior standing.**
A survey of British history since the seventeenth century.
478. **Technology and Society in Pre-Industrial Times (5). Pr., junior standing.**
The interplay between technology and other aspects of human culture during selected periods of pre-industrial history, using various methods and approaches.
479. **Technology and Society in the Industrial Revolution (5). Pr., junior standing.**
Various approaches to the study of the interaction between technology, industry, and society in the United States and other countries during selected periods, normally in the late eighteenth and nineteenth centuries.
480. **Technology, Society, and the Environment (5). Pr., junior standing.**
A study of contemporary social, technological, and environmental problems in historical perspective.
481. **Reform Movements (5). Pr., junior standing.**
The comparative study of reform movements and impulses in the United States and other countries during selected periods, with emphasis on the cultural and technological contexts of social change.

GRADUATE COURSES

600. Seminar in American History, 1763-1800 (5).
601. Seminar in American History, 1800-1850 (5).
602. Seminar in American History, 1850-1876 (5).
603. Seminar in American History, 1876-1914 (5).
604. Seminar in American History, 1914- (5).
605. United States Far Eastern Diplomacy (5).
606. United States Latin American Diplomacy (5).
607. United States Atlantic Diplomacy (5).
608. Seminar in American Social and Intellectual History (5).
609. Seminar in the Old South (5).
610. Seminar in the New South (5).
629. Historical Methods (5).
633. Seminar in Sixteenth Century Europe (5).
634. The Revolution of 1917-1921 (5).

- 635. Seminar in European History (5).
- 636. Colonial Latin America (5).
- 637. Latin America in the National Period, Revolutionary Movements, and National Developments (5).
- 638. Seminar in the French Revolutionary and Napoleonic Era (5).
- 639. Historiography and Theory of History (5).
- 640. Seminar in Tudor and Stuart England (5).
- 641. Seminar in Eighteenth Century England (5).
- 644. Seminar in Modern European Diplomacy (5).
- 699. Research and Thesis. (Credit to be arranged.)
- 799. Research and Dissertation. (Credit to be arranged.)

READING COURSES

The following reading courses are offered in order to give the graduate student an opportunity for study in specialized areas and are rigorously supervised by the professors responsible for the fields. Registration is by permission of the department and the major professor.

- 620. Directed Reading in American History to 1876 (5).
- 621. Directed Reading in American History Since 1876 (5).
- 622. Directed Reading in American Diplomacy (5).
- 623. Directed Reading in American Social and Intellectual History (5).
- 624. Directed Reading in Latin American History (5).
- 625. Directed Reading in Far Eastern History (5).
- 626. Directed Reading in English History (5).
- 627. Directed Reading in European History (5).

Horticulture (HF)

Professors Perkins, *Head*, Amling, and Orr
Associate Professors Chambliss, Harris, Norton, Perry, and Sanderson
Assistant Professors Dozier and Rymal
Instructor Martin

Landscape and Ornamental Horticulture

- 101. Introduction to Horticulture (1). Lec. 1. Fall.
An orientation course for freshman introducing all fields in Horticulture.
- 221. Landscape Gardening (5). Lec. 3, Lec-Dem. 4.
Principles of landscape gardening applied to the development of small home grounds and school grounds. The lecture-demonstration periods are devoted to the study of the identification and use of ornamental plants, landscape drawings, and the propagation and maintenance of ornamental plants.
- 222. Trees (5). Lec. 3, Lab. 4.
Identification, culture and use of ornamental trees in landscape plantings.
- 223. Evergreen Shrubs and Vines (5). Lec. 3, Lab. 4.
Identification, culture, and use of broadleaf and narrowleaf evergreens in landscape plantings.
- 224. Plant Propagation (5). Lec. 3, Lab. 4.
Basic principles and practices involved in the propagation of horticultural plants.
- 225. Flower Arranging (3). Lec. 2, Lab. 2. General elective.
Principles and practices of flower arranging for the home.
- 321. Deciduous Shrubs and Vines (5). Lec. 3, Lab. 4.
Identification, culture and use of deciduous shrubs and small trees in landscape plantings.
- 323. Greenhouse Environment Control (5). Lec. 4, Lab. 3.
Principles and practices of construction and utilizing greenhouses for various purposes such as plant propagation, crop production, and research.
- 325. Landscape Planning of Home Grounds (5). Lab. 15. Pr., HF 221.
Planning of large and small home grounds.
- 326. Landscape Planning of Public Grounds (5). Lab. 15. Pr., HF 221.
Planning of public areas and grounds of public buildings, including general layout, planting and detail treatment of special areas.

327. **Landscape Engineering (3).** Lec. 1, Lab. 6. Summer. Pr., FY 201 or permission of instructor.
Emphasis on the appreciation of forests for esthetic values as well as for production of various forest products. An evaluation of forest areas for recreational purposes. Consideration of campsite requirements, access and circulation as well as other phases of meeting such need.
421. **Care and Maintenance of Ornamental Plants (5).** Lec. 3, Lab. 4. Winter, odd years. Pr., BY 306, 309 and junior standing.
Principles and practices of the care and maintenance of trees and shrubs, including pruning, tree surgery, transplanting, and fertilization.
422. **Floricultural Crop Production (5).** Lec. 4, Lab. 3. Pr., HF 323 and junior standing.
Floricultural crop production under management in greenhouse and outdoor conditions.
423. **Nursery Management (5).** Lec. 3, Lab. 4. Winter, even years. Pr., HF 224, BY 306, AY 304 and junior standing.
Principles and practices of the management of a commercial ornamental nursery.
424. **Planting Design (5).** Lec. 3, Lab. 4. Pr., HF 222, 223, 321 and junior standing.
Principles and practices of the combination and use of ornamental plants in landscape plantings.
425. **Flower Shop Management (5).** Lec. 3, Lab. 4. Pr., HF 225, 422, permission of instructor.
Principles and practices of flower shop management and floral designing.
426. **Minor Problems (3-5).** May be taken more than once for a total of 15 hours. Pr., junior standing and permission of instructor.
Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or greenhouse investigations are made, under supervision of instructors. Graduate credit limited to one quarter.
429. **Advanced Plant Propagation (5).** Lec. 3, Lab. 4. Pr., HF 224, BY 306, and junior standing.
Commercial propagation of Horticultural plants with emphasis on the physiological and anatomical principles.
430. **Marketing Horticultural Speciality Products (5).** Lec. 3, Lab. 4. Pr., HF 422, HF 423.
Channels and methods of distribution of floricultural and nursery products.
431. **Advanced Landscape Gardening (4).** Lec. 3, Lab. 4. Pr., BI 101, HF 221, graduate standing.
Principles and practices applying to the use of ornamental plant material in landscaping. (Selected portions of this course may be offered as a 3 hour credit in the Master of Agriculture program.)
432. **Controlled Plant Growth (5).** Lec. 3, Lab. 4. Pr., AY 304, BY 306, CH 207, CH 208, HF 323, and junior standing.
Controlling and directing growth of plants by manipulation of the environment and by the use of chemicals.

General Horticulture

101. **Introduction to Horticulture (1).** Lec. 1. Fall.
An orientation course for freshmen introducing all fields in Horticulture.
201. **Orchard Management (5).** Lec. 3, Lab. 4. Fall and Spring.
Propagating, planting, pruning, cultivating, fertilizing, spraying, thinning, harvesting, grading, storing and marketing the most valuable fruits and nuts grown in the South.
308. **Vegetable Crops (5).** Lec. 3, Lab. 4. Fall, Winter, Spring.
Principles and special practices used in production of vegetable crops.
340. **Industrial Food Preservation Technology (5).** Lec. 3, Lab. 4. Fall, odd years. Pr., junior standing or consent of instructor.
Principles of food preservation as applied to industry. Processes considered include refrigeration, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives.
341. **Industrial Food Equipment and Processes I (5).** Lec. 3, Lab. 4. Winter, even years. Pr., junior standing or consent of instructor.
Material and structural requirements of food equipment, and basic principles and processes such as heat exchange, refrigeration, evaporation, distillation, homogenization, extraction, filtration, centrifugation, fluid flow and instrumentation.
342. **Industrial Food Equipment and Processes II (5).** Lec. 3, Lab. 4. Spring, even years. Pr., junior standing or consent of instructor.
Continuation of subject matter of HF 341 with emphasis on unit operations and processes.

343. **Food Analysis and Quality Control (5).** Lec. 3, Lab. 4. Fall, even years. Pr., CH 208.
Sensory, chemical, and instrumental food analysis and its application to quality control and evaluation of grades and standards.
344. **Technology of Jellies and Snack Foods (5).** Lec. 3, Lab. 4. Spring, even years. Pr., junior standing or consent of instructor.
Technology of commercial production of jams, jellies, preserves and snack foods. Includes studies of processing and packaging methods, equipment, grades, standards, and visits to commercial plants.
345. **Food Chemistry (3).** Lec. 3. Spring. Pr., CH 207.
The chemistry of the important components of foods and changes occurring during processing, storage and handling.
401. **Commercial Vegetable Crops (3).** Lec. 2, Lab. 2. Fall. Pr., HF 308 and junior standing.
An advanced course in the production of the major commercial vegetable crops.
402. **Storage, Packaging and Marketing of Vegetable Crops (3).** Lec. 2, Lab. 2. Winter. Pr., junior standing.
Physiological, pathological, and horticultural principles in storing, packaging, and marketing of commercial vegetable crops.
404. **Fruit Growing (5).** Lec. 4, Lab. 2. Fall. Pr., HF 201 and junior standing.
Production and marketing of commercial tree fruits grown in the South.
405. **Small Fruits (5).** Lec. 4, Lab. 2. Winter. Pr., HF 201 and junior standing.
Principles and practices involved in the production of strawberries, grapes, blueberries, and brambles.
406. **Nut Culture (5).** Lec. 4, Lab. 2. Spring. Pr., HF 201 and junior standing.
Production and marketing of pecans, walnuts, and chestnuts.
408. **Commercial Vegetable Crops (3).** Lec-Lab. 4. Spring or Summer. Pr., HF 308 and graduate standing.
Application of research information to the commercial production and handling of the principal vegetable crops. (Credit for both HF 408 and 401 may not be used to meet requirements for the Master's degree.)
410. **Recent Advances in Small Fruits (3).** Spring and Summer. Pr., HF 201 and graduate standing.
Scientific advances in small fruits and their application to small fruit culture in Alabama. (Credit for both HF 410 and HF 405 may not be used to meet requirements for the Master's degree.)
- 426-427-428. **Minor Problems (3-5 each).** Lec. 1, Lab. 8. Pr., junior standing and permission of instructor.
Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or greenhouse investigations are made, under supervision of instructors. Graduate credit limited to one quarter.
440. **Food Engineering (5).** Lec. 3, Lab. 4. Winter, even years. Pr., junior standing.
Application of physics and engineering principles to food processing operation, instrumentation in food processing, process and equipment development.

GRADUATE COURSES

601. **Experimental Methods in Horticulture (5).** Lec. 3, Lab. 6. Any quarter.
Purposes of research, discovery, and progress as related to the scientific method; research programs, horticultural programs, selecting projects, reviewing literature, preparing project outlines, conducting experiments, recording data, analyzing data, and publication of results.
602. **Seminar (1).** Fall, Winter, and Spring. May be taken more than once for a maximum of three hours credit.
603. **Special Problems in Horticulture (3-5).** Credit to be arranged. Any quarter. Pr., graduate standing.
Selected problems in vegetable production, pomology, food technology, or ornamental horticulture.
604. **Plant Growth and Development (5).** Lec. 4, Lab. 2. Any quarter. Pr., HF 432 or BY 306 and consent of instructor.
Morphological and physiological changes in horticulture plants as induced by growth regulators and their theoretical implications in the improvement of horticultural crops production.
605. **Nutritional Requirements of Horticultural Plants (5).** Lec. 4, Lab. 2. Any quarter.
Nutritional requirements of horticulture crops and factors affecting these requirements.
606. **Physiology of Horticultural Products Following Harvest (5).** Lec. 3, Lab. 4. Any quarter. Pr., BY 306 and graduate standing.
Physiological changes occurring in fresh fruits, vegetables, and other horticultural plant products after harvest. Methods of studying these changes and factors influencing them.

607. **Breeding of Horticultural Crops (5).** Lec. 3, Lab. 4. Any quarter. Pr., ZY 300 and graduate standing.

An application of genetic principles in the propagation and maintenance of fruit, vegetable, and ornamental crop varieties. The genetic basis of some production problems, and special breeding methods applicable to horticultural crops.

699. **Research and Thesis.** Credit to be arranged. May be taken more than one quarter.

Industrial Engineering (IE)

Professors Brooks, *Head*, and Denholm
Associate Professors Hool, Layfield, Morgan, and White
Assistant Professors Boyd, Herring, Maghsoodloo, Smith,
Trucks, Webster, and Zaloom

201. **Industrial Administration (3).** Pr., sophomore standing.
The concepts, techniques, and functions of engineering management. (Not open to Industrial Engineering students.)
202. **Industrial Engineering Fundamentals (3).**
Introduction to the fundamentals of tools and techniques used in the practice of industrial engineering. The relationships of the sub-disciplines of industrial engineering to the current curriculum and typically encountered problems are explored. Introduction to computer programming and the FORTRAN programming language.
204. **Computer Programming (3).** Pr., MH 162.
Digital computer programming with emphasis on mathematical problems, using FORTRAN programming language. (Not open to students with credit in IE 300.)
300. **Computer Programming and Introduction to Information-Decision Systems (3).** Lec. 2, Lab. 3. Pr., An introductory knowledge of FORTRAN, MH 265 or concurrently.
Intermediate computer programming using the FORTRAN programming language with emphasis on mathematical and engineering problems. Included are introductory design considerations for information-decision systems involving computers as a principle data processing device. (Intended primarily for engineering students and not open to students with credit in IE 204.)
301. **Information Retrieval and Computer Programming (3).** Lec. 2, Lab. 3. Pr., IE 202, or IE 204, or knowledge of a computer language.
An introduction to digital computer programming with emphasis on information retrieval problems using COBOL programming language.
302. **Production Control Techniques (3).** Pr., IE 201, or EC 300.
Planning, scheduling, routing, and dispatching in manufacturing operations. Mechanisms for production control. (Not open to Industrial Engineering students.)
305. **Information-Decision Systems (3).** Lec. 2, Lab. 3. Pr., IE 300.
Interrelated components of complex management information-decision systems. Design considerations for systems involving computers as a principle data processing device.
310. **Motion and Time Study (5).** Lec. 4, Lab. 3. Pr., EC 274.
Principles and practices of methods engineering and time study. (Not open to students with credit in IE 318 or IE 419.)
311. **Engineering Statistics I (3).** Pr., MH 264.
Basic probability, random variables and distribution functions.
312. **Engineering Statistics II (3).** Pr., IE 311.
Descriptive statistics, sampling concepts, sums of random variables and an introduction to hypothesis testing.
313. **Engineering Statistics III (3).** Pr., IE 312.
Estimation, goodness of fit tests, regression-correlation methods and introduction to analysis of variance.
314. **Operational Analysis I (3).** Pr., IE 202, IE 311.
Nature of operational systems analysis; decision theory; formulation of objective; identification of alternatives; concept of systems analysis (system description); model building; concept of optimization; introduction to model solution methods.
315. **Linear Programming (3).** Pr., MH 266.
Introduction to linear programming with emphasis on model formulation and solution. Other topics include computer solution variations of the simplex method, optimality analysis, duality, transportation problem and allocation problem.
316. **Electronic Data Processing Systems Design (4).** Lec. 3, Lab. 3. Pr., IE 204, IE 301 or IE 305.
Application of computer and associated data processing equipment to business and administrative information and decision systems design.
317. **Ergonomics I (3).** Pr., IE 202, PG 211.
An introduction to the scientific study of man in relation to his work environment; human characteristics with respect to performance in man-machine systems; introduction to man-machine systems design.

318. **Ergonomics II (3). Lec. 2, Lab. 3. Pr., IE 317, PG 321.**
The analysis and design of work places and work methods through application of ergonomic and methods engineering principles.
320. **Engineering Economy (5). Pr., MH 161 and junior standing.**
Practical engineering studies for the economic selection of structures, equipment, processes and methods. (Not open to students with credit in IE 325 or IE 326.)
325. **Engineering Economic Analysis I (3). Pr., MH 265, EC 200 or equivalent or concurrently.**
The development of principles required in engineering economy studies and other decision-making oriented courses. Topics include interest and interest formula derivations, depreciation methods, tax considerations and cost accounting. (Not open to students with credit in IE 320.)
326. **Engineering Economic Analysis II (3). Pr., IE 311, IE 325.**
Engineering studies for the economic selection of structures, equipment, processes and methods. Topics include replacement theory, managerial and production economics, new venture analysis and capital budgeting. (Not open to students with credit in IE 320.)
400. **Seminar in Industrial Engineering (1). Pr., senior standing in Industrial Engineering.**
Discussion of current problems, professional practice and professional opportunities.
401. **Occupational Safety Engineering Fundamentals (3). Pr., junior standing.**
Hazard problems generated in occupational environments and their solution or mitigation through application of quantitative analyses and engineering design principles.
402. **Systems Analysis for Occupational Safety (3). Pr., IE 401 or concurrently.**
Analysis of safety performance, attribution of cost, identification and analysis of accident potential. Fault-free analysis. Systems safety and reliability.
403. **Occupational Accident Prevention (3). Pr., IE 401 or concurrently.**
Design principles and concepts of hazard evaluation analysis relating to operation of industrial facilities.
404. **Occupational Hygiene Engineering I (3). Pr., IE 419 or permission of instructor.**
An introduction to Occupational Hygiene Engineering with emphasis on workplace environmental quality. Heat, illumination, noise, and ventilation.
405. **Occupational Hygiene Engineering II (3). Pr., IE 404.**
A continuation of Occupational Hygiene Engineering I. Plant and workplace sanitation, plant waste control, health hazard control, principles of epidemiology.
406. **Occupational Safety and Health Laboratory (3). Lec. 1, Lab. 6. Pr., IE 403, IE 405, or concurrently.**
Case histories and problems will be examined for factors proven detrimental to safety and health. Solutions designed to assure non-reoccurrence of these conditions. Solutions to be aided by actual laboratory testing and field trips.
410. **Engineering Statistics (5). Pr., MH 264, junior standing.**
Basic probability, random variables, discrete and continuous distributions, sampling distributions, hypothesis testing, estimation, regression and correlation, one-way analysis of variance, testing goodness of fit. (Not open to students with credit in IE 311 and not open to Industrial Engineering undergraduate students.)
411. **Operational Research (5). Pr., MH 266, IE 410 or equivalent or concurrently.**
Model construction, linear programming, network models, dynamic models, stochastic models, queueing theory, decision theory and simulation. (Not open to students with credit in IE 314 and not open to Industrial Engineering undergraduate students.)
414. **Engineering Statistics IV (3). Lec. 2, Lab. 3. Pr., IE 313.**
Emphasis on quality control in manufacturing by means of statistical methods.
416. **Operational Analysis II (3). Pr., IE 305, IE 312.**
Simulation procedures for solving complex systems analysis problems. Emphasis on random processes, model building, and construction of computer simulation models.
417. **Operational Analysis III (3). Pr., IE 314, IE 315.**
Game theory; queueing theory; non-deterministic inventory models; replacement models; sequencing and scheduling models. Application to operational systems analysis.
419. **Ergonomics III (3). Lec. 2, Lab. 3. Pr., IE 313, IE 318, PG 321.**
The assessment of human work performance and the establishment of performance standards.
424. **Production Control Functions I (3). Pr., IE 326, IE 419, or concurrently.**
Functions of production control; forecasting; inventory analysis; scheduling; dispatching and progress control.
425. **Production Control Functions II (3). Pr., IE 424, IE 427 or concurrently.**
Functions of production control; production planning; line balancing; plant location; plant layout; manufacturing processes.
427. **Operations and Facilities Design I (3). Lec. 2, Lab. 3. Pr., IE 326.**
Design principles and concepts of complex systems. (Should be taken the quarter immediately prior to the taking of IE 428.)
428. **Operations and Facilities Design II (3). Lab. 9. Pr., IE 417, IE 424, IE 427.**
The design of industrial, institutional, governmental and service operations and facilities. (Should be taken during student's final quarter.)

- 436. Plant Location (3). Pr., IE 315, IE 326, IE 417.**
Factors and techniques pertinent to the economic location of industrial plants.
- 438. Occupational Safety and Health Engineering (5). Pr., senior standing or consent of instructor.**
Occupational safety and health problems with emphasis on the role of the industrial engineer in the elimination of physical and environmental hazards. (Not open to Industrial Engineering undergraduates enrolled in the Occupational Safety and Health option.)
- 490-491-492. Industrial Engineering Problems (1-5). Pr., permission of instructor and department head approval.**
Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.

Advanced Undergraduate and Graduate Courses

- 440. Sampling and Survey Techniques (3). Pr., IE 313 and junior standing.**
Theory and application of statistical sampling and survey methods, with emphasis on methods optimization.
- 441. Applied Industrial Engineering Mathematics (3). Pr., MH 265 and junior standing.**
Formulation and solution of differential and difference equations. Solution techniques will include analytical theory, Laplace and Z transforms and computer techniques. Introduction to state variables, matrix algebra and analysis.
- 442. Advanced Linear Programming (3). Pr., IE 315 and junior standing.**
Continuation of IE 315 with emphasis on theory. Revised simplex, dual simplex, parametric programming, decomposition, and applied problems.
- 443. Inventory Control (3). Pr., IE 414, IE 417, IE 424 and junior standing.**
Application of quantitative methods to the control of industrial inventories.
- 453. Dynamic Programming (3). Pr., MH 264 and junior standing.**
The theory and methods of dynamic programming will be presented. Specific applications will be discussed.
- 455. Advanced Computer Programming (3). Pr., IE 300 or consent of instructor and junior standing.**
Formal definition and presentation of several numeric and nonnumeric problems using two or more programming languages other than FORTRAN and COBOL.
- 458. Reliability Engineering (3). Pr., IE 414, IE 417, and junior standing.**
Reliability, maintenance, and replacement, with emphasis on quantitatively descriptive methods to be used for problem solving.
- 459. Operational Control System Design (3). Pr., IE 425, and junior standing.**
The design of operational planning and control systems. Integration of individual systems functions. Concept of total systems optimization.
- 460. Materials Handling Systems (3). Pr., IE 318, IE 416, IE 417 and junior standing.**
Quantitative analysis and design of material handling systems. Quantitative methods and case studies.
- 461. Advanced Facilities Design (3). Pr., junior standing and consent of instructor.**
Quantitative methods used to design production and service facilities are emphasized. Case studies.
- 464. Ergonomics IV (3). Pr., IE 419 or consent of instructor, senior standing.**
A study of the philosophy and techniques of man-machine systems design. Emphasis is placed on proper integration of man into production systems.
- 470. Project Management (3). Pr., IE 417, or permission of instructor and junior standing.**
Project management and development with primary emphasis on use of operations research methods and cost analysis. Includes a study of the application of CPM and PERT to project management.
- 471. Continuous Process Control and Dynamics (3). Pr., IE 441 and junior standing.**
Continuous process dynamics and block diagram formulation. Conventional continuous process control and introduction to advanced control topics.
- 472. Engineering of Organization and Management (3). Pr., senior standing and consent of instructor.**
Organizational theory and concepts; the interaction between the individual and the organization.
- 480. Data Processing Fundamentals (5). Pr., junior standing and consent of instructor.**
An introduction to business data processing methods and procedures, hardware (primarily electro-mechanical and electronic), and software. Introductory programming using the COBOL language emphasizing business applications. (Not for science and mathematics students.)
- 481. Design of Occupational Safety and Health Administrative Systems (3). Coreq., IE 472 and junior standing.**
The design of administrative systems to carry out the OSH function in industrial, service and governmental organizations.

GRADUATE LEVEL COURSES

616. **Industrial Dynamics (3). Pr., IE 416 or permission of instructor.**
Industrial dynamics based on a systems approach to industrial and related problems, with emphasis on decision-making.
617. **Advanced Simulation Problems (3). Pr., IE 416 or permission of instructor.**
Journal readings of applications simulation and development of procedure to solve large scale, realistic simulation problems.
620. **Advanced Engineering Economy (3). Pr., IE 326 or consent of instructor.**
Engineering and economic aspects of selection and replacement of equipment, relationship of technical economy to income taxation, depreciation, load factor, capacity, and environmental and social factors.
621. **Queueing Theory (3). Pr., IE 313 or IE 410, MH 265, or consent of instructor.**
Mathematical models of queueing, with applications to problems such as materials flow, inventory policy, and service center design. Simulation solutions to queueing networks are considered.
622. **Markov Chains (3). Pr., IE 417.**
Finite and continuous Markov Chains, Poisson and Wiener processes, applications will be discussed.
623. **Time Series (3). Pr., IE 417.**
Stationary stochastic processes, time series analysis with emphasis on spectral density functions and applications will be discussed.
624. **Inventory and Production Control Systems (3). Pr., IE 425.**
Advanced topics in production control and inventory theory. The relationships between production and inventory will be discussed.
630. **Advanced Statistical Methods for Engineers I (3). Pr., IE 312.**
Elaboration of basic statistical methods for engineers, with emphasis on a more theoretical study of multiple linear regression and the optimization of multiple linear regression procedures.
631. **Advanced Statistical Methods for Engineers II (3). Pr., IE 630.**
Extension of IE 630, with primary emphasis on analysis of variance methods. Includes a theoretical study of analysis of variance methods, mathematical derivation of mean squares, multiple comparison tests, and the Bennett and Franklin algorithm.
632. **Advanced Statistical Methods for Engineers III (3). Pr., IE 631.**
Introduction to the philosophy and methods of statistical design optimization, with emphasis on optimum multiple linear regression designs, optimum analysis of variance designs, and an introduction to response surface analysis.
634. **Non-Linear Programming (3). Pr., IE 442.**
This course covers Quadratic Programming, Separable Programming, Gradient Methods, and Integer Programming.
640. **Non-Parametric Statistics (3). Pr., IE 313.**
Several non-parametric and distribution-free methods with emphasis on engineering applications.
642. **Input-Output Analysis (3). Pr., IE 442 or consent of instructor.**
Input-Output analysis for interindustry, industry, and company study. Computational aspects of large scale models. Case studies.
644. **Optimization Theory for Large Systems (3). Pr., IE 442, IE 634, or consent of instructor.**
Large problems with special structures; decomposition principle, many column problems, relaxation procedures, in linear programming, generalized upper bounding, partitioning procedures, and applications.
653. **Advanced Dynamic Programming (3). Pr., IE 453.**
Advanced topics in the theory and application of dynamic programming. Numerical methods to solve specific types of problems. Case studies.
663. **Decision and Game Theory (3). Pr., IE 313 or IE 410, or consent of instructor.**
Classification of decision problems, Bayes risk, utility theory and its applications, optimal strategies for rectangular games, and use of linear programming in solving zero-sum games.
664. **Management Information Decision Systems (3). Pr., permission of instructor.**
Analysis of organizations for information requirements, information flow, data storage and usage and total information systems.
665. **Advanced Topics in Human Engineering (3). Pr., IE 464.**
Human information processing with particular emphasis on human decision behavior.
670. **Advanced Computation Methods (3). Pr., permission of the instructor.**
Advanced computer languages, pattern recognition, and hybrid computation. This course is designed to keep the graduate student abreast of current ideas in this rapidly expanding field.
671. **Discrete Process Control and Dynamics (3). Pr., IE 471.**
Sampled-data control systems and computer control topics. Representation of discrete industrial processes.

672. **Functional Optimization Theory (3).** Pr., IE 417.
Introduction to functional optimization theory including min-max theory, calculus of variations, pontryagin, maximum principle and applied functional analysis.
680. **Advanced Topics in Occupational Safety and Health (3).** Pr., IE 438 or equivalent. Coreq., IE 631 and IE 665, or permission of instructor.
Selected topics, including risk taking, accident proneness, and biomechanics, will be pursued at the advanced level. Quantification and modeling is emphasized.
681. **Advanced Occupational Accident Prevention (3).** Pr., IE 438 or equivalent or permission of instructor.
Advanced topics in accident prevention with emphasis on current developments.
690. **Industrial Engineering Project.** Credit to be arranged.
May be taken more than one quarter for a maximum of 9 hours.
699. **Thesis (0-7).**

Interdepartmental Education (IED)

Included in this section are program areas and course listings designed and taught on the interdepartmental basis. The subheadings reflect the nature and scope of the offerings.

Curriculum and Teaching – Elementary-Secondary

Teaching, Program, and Internship

Students in either secondary or elementary education pursuing a curriculum leading to K-12 certification for teaching in a particular field in elementary and secondary schools will take the Teaching and the Program courses in the teaching field in which certification is expected.

414. **Teaching in Elementary and Secondary Schools (3).** Lec. 2, Lab. 2. Pr., FED 320 or equivalent.
(A) Art, (C) Theatre, (J) Music, (M) Speech Communication, (N) Speech Pathology.
423. **Program in Elementary and Secondary Schools (3).** Lec. 2, Lab. 2. Pr., FED 320 or equivalent.
(A) Art, (C) Theatre, (J) Music, (M) Speech Communication, (N) Speech Pathology.
425. **Professional Internship in Elementary and Secondary Schools (15).** Pr., senior standing, Admission to Teacher Education three quarters prior to Internship, minimum of two appropriate Teaching and Program Courses.
(For description, see Professional Internship under School of Education.) (A) Art, (C) Theatre, (J) Music, (M) Speech Communication, (N) Speech Pathology.

Graduate

Courses 651, 652, 653, or 654, apply to the following areas of the school program: (A) Art, (C) Theatre, (E) Gifted, (I) Mental Retardation, (J) Music, (M) Speech Communication, and (N) Speech Pathology.

648. **Advanced Study of Curriculum and Teaching (5).** Pr., FED 647 or consent of instructor.
Major issues, frontier developments, and trends in the improvement of curriculum and teaching in elementary and secondary schools.
651. **Research Studies in Education in Areas of Specialization (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.
Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **Curriculum and Teaching in Areas of Specialization (5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.
Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **Organization of Program in Areas of Specialization (2-5).** Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.
Advanced course. Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.

654. **Evaluation of Program in Areas of Specialization (2-5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization with the total school program and with other educational programs of the community.
658. **Seminar and Independent Study in Curriculum and Teaching (5). Pr., FED 647 and IED 648, or permission of instructor.** Research and experimentation in elementary and secondary schools in the development of education programs and the improvement of teaching and learning. Appraisal of significant curriculum research, exploration of areas of needed research in curriculum and instruction, and study of fundamental criteria and methods for solving curriculum problems.

Special Education (Behavior Disturbance and Mental Retardation)

376. **A Survey of Exceptionality (5).** An introduction to the several types of exceptionality with an emphasis upon the educational and training implications of each.
377. **Introduction to Mental Retardation (5). Pr., IED 376 or permission of instructor.** An introductory exploration of mental retardation as a special type of exceptionality with emphasis placed upon implications for the education and training of the retarded.
378. **An Introduction to Behavior Disturbance (5). Pr., IED 376 or permission of instructor.** An introductory exploration of behavior disturbance as a special type of exceptionality with emphasis placed upon implications for the education and training of the behavior disturbed.
425. **Professional Internship in Special Education (5, 10, 15). Pr., senior standing, admission to Teacher Education three quarters prior to Internship, appropriate professional courses.** (For description, see Professional Internship in School of Education Section). (A) Mental Retardation. (B) Behavior Disturbance
479. **Methods and Materials for Teaching in Special Education (5). Pr., IED 376 and IED 377 or IED 378.** (A) Mental Retardation. (B) Behavior Disturbance. Not open to Undergraduate Special Education Majors.

Advanced Undergraduate and Graduate

480. **Education of Children With Special Learning Disabilities (5). Pr., junior standing and admission to Teacher Education.** Existing theories and instructional programs for children with special learning disabilities. Administrative arrangements, classroom management, individual educational evaluation and programming are emphasized.
486. **The Severely Mentally Retarded (5). Pr., junior standing and permission of instructor.** An indepth study of severe mental retardation as a special type of exceptionality with emphasis upon implications for the education and training of the severely retarded.

Graduate

600. **Advanced Study of Exceptionality (5). Pr., Appropriate undergraduate preparation in Special Education or permission of instructor.** An advanced study of the several types of exceptionality with an emphasis upon the educational and training implications of each.
601. **Advanced Study of Educational Aspects of Mental Retardation (5). Pr., IED 600, or permission of instructor.** An advanced study of mental retardation as a special area of exceptionality with emphasis upon the education and training needs of the retarded.
643. **Education of the Physically Handicapped (5). Pr., adequate courses in physiology and psychology.** Characteristics of major physical disabilities; the psychology of the physically handicapped; the educational objectives with curriculum adaptations; and related aspects of a total program for the physically handicapped.
650. **Teaching the Mentally Retarded (5). Pr., IED 476, IED 478 and IED 479.** Observation and participation under supervision in education programs for the mentally retarded. Lectures and discussions will implement the student's work in the classroom. Students will develop and evaluate plans and programs for the special class. (For teachers pursuing a program of education for mentally retarded children.)
670. **Educational Procedures for Children With Behavior Disorders (5). Pr., Graduate standing and permission of instructor.** Analysis of current provisions for children with emotional conflicts, with emphasis on educational procedures and implications for learning disabilities.

- 671. Current Research on the Behavioral Disorders of Children (5). Pr., Graduate Standing and permission of instructor.**
Examination and interpretation of research. Emphasis on educational implications of emotional conflict, classroom guidance and control.

Higher Education

Graduate

The courses described below along with AED 618 and AED 697 are designed especially for advanced students who are interested in positions in colleges, universities, and other post secondary-school institutions.

- 645. Problems of Teaching the Marginally Prepared College Student (5). Pr., IED 665 or IED 666 or permission of instructor.**
Socioeconomic and cultural backgrounds as they affect learning styles of the marginally prepared student. Develop methods of appropriate teaching strategies as a means of improving the self-concept of these students.
- 649. The Community College Program (5).**
A study of the program of the comprehensive community-junior college designed to improve competencies in program planning, evaluation, and administration.
- 663. The American College and University (5).**
Philosophy and function, the university and social change, the community college, academic freedom, student-faculty-community relationships; international flow of educational ideas, government cultural programs, higher education and the state.
- 665. The Community College (5).**
The rise and development of the community/junior college in American education; its history, philosophy, and functions.
- 666. Undergraduate Instruction in Higher Education (5). Pr., IED 663 or IED 665 or permission of instructor.**
The development and selection of appropriate curricular materials and effective teaching strategies. Evaluation of instruction and learning effectiveness in undergraduate programs of higher education.

The above courses, along with AED 618, AED 697, CED 653 and CED 654 constitute a core for the development of programs of study in higher education. Other offerings, in both academic and professional fields, are available for the completion of advanced programs. These include administration and supervision; foundations of education; psychology; student personnel; vocational and technical education; and professional and academic preparation for teaching in agricultural sciences, business administration, economics and sociology, English, health and physical education, history, home economics, mathematics, music, philosophy, physical and biological sciences, and speech.

Journalism (JM)

Professor Burnett
Assistant Professor Logue

Freshman English is prerequisite for all courses in journalism.

- 221. Beginning Newswriting (5).**
Introduction to newswriting, newspaper style, and mechanical practice, supplemented by work on the college newspaper.
- 223. Reporting (5). Pr., JM 221.**
The technical aspects of reporting and newsgathering methods, supplemented by work on the college newspaper.
- 224. Copyreading and Editing (5). Pr., JM 221.**
Methods of editing copy, writing headlines, basic make-up and proof reading.
- 315. Agricultural Journalism (3).**
Designed for students in agriculture and home economics. Introduces practices of news coverage and writing, with major emphasis on specialized fields of study.
- 322. Feature Writing (5). Pr., JM 221 or consent of the instructor.**
Gathering material for the writing of "human interest" and feature articles for newspapers and magazines, with consideration given to the marketing of manuscripts.

323. **The Community Newspaper (5). Pr., JM 221.**
Methods, problems, and policies involved in editing the community newspaper, as differing from the metropolitan daily.
421. **Photo-Journalism (5).**
Uses and processes of photography in the newspaper and magazine field. Operation of press cameras and the technique of developing, printing, and enlarging of pictures is provided.
- 422-423. **Journalism Workshop (3-3). All quarters. Pr., 15 hours of journalism, including JM 221 and 223, and consent of instructor.**
A two-quarter course giving practical experience in preparation of newspaper, radio, television, and magazine copy through supervised work with University communication media.
425. **Journalism Internship (6). All quarters. Pr., JM 221, 223, 224, and consent of instructor.**
A full-time internship of at least ten weeks with an approved publication, serving as a regular staff member under the direction of the editor.
465. **The History and Principles of Journalism (5).**
The development of the American Press, the principles and ideals of modern journalism, and the law of the press and radio.

GRADUATE COURSES

605. **Agricultural Newswriting (3). Lec. 4. Pr., 20 hours of journalism or consent of instructor.**
Methods and problems of writing agricultural and home economics news, feature articles, and columns for publication. Special attention is given to improving effectiveness of communication.

Laboratory Technology (LT)

Assistant Professor Wheatley

101. **Orientation (1). Fall and Winter quarters.**
Aims, objectives, and requirements for careers in Medical and Laboratory Technology.
301. **Hematology (5). Lec. 3, Lab. 6.**
Study, procedures, and examinations of the blood, as recommended by the American Society of Clinical Pathologists.
401. **Advanced Hematology (5). Lec. 3, Lab. 6. Pr., LT 301.**
Advanced study of blood cells and blood dyscrasias.
402. **Seminar in Laboratory Technology (3). Pr., LT 301.**
The student reports from the literature on recent advances in the field of laboratory technology.
404. **Immunology I (5). Lec. 3, Lab. 4. Pr., VM 204 and junior standing.**
Theory of immunology and techniques of laboratory tests based on the antigen-antibody reaction.
405. **Immunology II (5). Lec. 2, Lab. 6. Pr., LT 404 and junior standing.**
Theory and techniques of the serological study of human blood and lipid antigens.
422. **Hospital Laboratory Practice (5). Lab. 15. Pr., LT 301.**
Practice applications of the principles, procedures, and techniques encountered in hospital laboratories.

Law Enforcement (LE)

Instructor Pendergast

360. **Survey of Law Enforcement (5). Pr., sophomore standing.**
Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation. (Same as PO 360.)
362. **Criminal Investigation (5). Pr., sophomore standing.**
Criminal investigation procedures, including theory of investigation, case preparation, specific techniques for selected offenses, questioning of suspects and witnesses, and problems in criminal investigation.
460. **Survey of Criminalistics (5). Pr., PO 362 and junior standing. Not open to graduate students.**
Survey of scientific crime detection methods; crime scene search, identification and preservation of evidence; lie detection, *modus operandi*; fingerprint identification, and related subjects.

462. **Police Administration and Organization (5).** Pr., junior standing. Not open to graduate students.
Principles of organization and administration in law enforcement; functions and activities; planning and research; community relations; personnel and training; inspection and control; policy formulation.
464. **Internship in Law Enforcement (5).** Pr., junior standing and consent of department head. Not open to graduate students.
Internship in an approved law enforcement or correctional agency under supervision of the agency concerned. Written reports on internship required.

Library (LY)

101. **Use of the Library (1).**
Lectures and assignments designed to develop skill in the use of the card catalog, and in the use of indexes and bibliographies. Taught by library staff members. Note: School Library Science courses are listed in the Interdepartmental Education heading.

Management (MN)

Professors Henry, *Head*, Pickle, and West
Associate Professors Alexander, Allen, Lamar, Myles, and Snow
Assistant Professors Bond, Bressler, Brown, Crim, Goodwin,
F. O. Hale, Holley, Horn, Little, Myers, and Smith
Instructor M. Street

Management

207. **Electronic Data Processing Principles (5).** Lec. 3, Lab. 3. Pr., 10 hours math, ACF 211 (concurrently).
Functions and uses of computers and related equipment emphasizing business application using an appropriate programming language.
310. **Principles of Management (5).** Pr., junior standing.
Management functions and the application of management principles in organizations.
341. **Business Law I (5).** Pr., junior standing.
Introduction to law, torts, contracts, agency and personal property.
342. **Business Law II (5).** Pr., MN 341.
Legal principles concerning real property, sales, negotiable instruments, partnerships, and corporations.
344. **Environmental Law (5).** Pr., junior standing.
Federal, State, and local law on conservation and regulation of environmental matters.
346. **Human Relations in Management (5).** Pr., MN 310.
The principles of human relations as applied to business.
380. **Industrial Management (5).** Pr., junior standing and MN 310.
Principles and practices of modern scientific management as applied in the actual control and operation of industrial enterprises.
440. **Organization Theory (5).** Pr., MN 346.
Organization theory and principles in the management of business operations.
442. **Personnel Management (5).** Pr., MN 310 or IE 201, junior standing.
Management of labor, dealing with selection, training, placement, turnover, payment policies, employee representation, etc.
443. **Problems in Personnel and Industrial Relations Management (5).** Pr., MN 442, EC 445, or consent of instructor.
This course emphasizes the study of contemporary issues and problems concerning the employee-employer relationship.
444. **Collective Bargaining and Arbitration (5).** Pr., EC 350 or EC 444 or consent of instructor.
Investigation and analysis of the theory and practice of collective bargaining and arbitration between unions and management.
447. **Wage and Salary Administration (5).** Pr., MN 442, and junior standing.
Various Methods of determining employee remuneration and problems in administering a wage and salary program.
449. **Advanced Personnel Management (5).** Pr., MN 442 or PG 461, and junior standing.
The solution of selected subjects or problems which confront personnel managers and related supervisory personnel.

455. **Legal Environment of Business (5). Pr., junior standing.**
Legal environment for business operation with emphasis on contemporary legal issues.
480. **Business Policies and Administration (5). Pr., junior standing and completion of core course of School of Business.**
The formulation and application of policies and programs pertaining to personnel, production, finance, procurement and sales in the business enterprise.
481. **Managerial Analysis (5). Pr., MN 207, MN 310, 10 hours math.**
Application of quantitative management techniques to the operation of the business firm.
482. **Management Information Systems (5). Pr., MN 310 and MN 207 or equivalent.**
Analysis and application of information flow in the business firm.
490. **Special Problems (1-10). Pr., junior standing and consent of instructor. May be repeated.**
The investigation and research into problems with special interest for the student.

GRADUATE COURSES

605. **Human Relations In Business Organization (5). Pr., consent of instructor.**
Advanced study of human relations in individual and group interactions within the environment of business organizations. Emphasis on research literature in the field.
606. **Management Problems (5). Pr., consent of instructor.**
Basic administrative problems in business and industry. Managerial controls as applied to administrative and operative functions.
607. **Managerial Economics (5). Pr., consent of instructor.**
Decision theory and criteria for decision-making concerning output, pricing, capital budgeting, scale of operations, investment and inventory control. Attention is also given to concepts of profits, production and cost functions.
640. **Advanced Organization Theory (5). Pr., MN 440 or equivalent, consent of instructor.**
Study of traditional and contemporary organization theories with emphasis on current research and controversy.
649. **Management Science (5). Pr., MN 481 or equivalent, consent of instructor.**
The study and application of management science theory to business operations.
650. **Seminar (1-10). Pr., graduate standing or consent of instructor. May be repeated.**
For those students engaged in intensive study and analysis of management problems.
690. **Special Problems (1-5). Pr., consent of instructor.**
Variable content in the management area.
696. **Readings in Production and Personnel Management (1-10). Pr., consent of instructor. May be repeated.**
General management theories, practices, and functions in industry and business. Also, covers the role of personnel management and human relations.
699. **Research and Thesis. Credit to be arranged.**

Office Administration

200. **Typewriting I (3). Lab. 5.**
Mastery of keyboard; techniques of machine operation; basic typewritten applications. For students with no previous training in typewriting. (Students with high school typewriting are not eligible for this course.)
201. **Typewriting II (3). Lab. 5. Pr., MN 200 with grade of C or one year of high school typewriting.**
Emphasis on business letters and forms; tabulation; reports.
202. **Typewriting III (3). Lab. 5. Pr., MN 201 with grade of C.**
Advanced typewritten communications with special problems and arrangement. (Students with two years of high school typewriting consult with OA staff about placement.)
203. **Typewriting IV (2). Lab. 3.**
Statistical typewriting; composition at the typewriter; executive office projects.
210. **Shorthand I (5). Pr., MN 200 or equivalent.**
Principles of Gregg shorthand, DJS. Rapid reading of shorthand; introduction of dictation techniques. For student with no previous training in shorthand. Students with one year of high school shorthand begin with second course.
211. **Shorthand II (5). Pr., MN 210 with grade of C or equivalent.**
Continuation of Shorthand I; dictation and development of pretranscription skills. Students with two years of high school shorthand begin with third course.
212. **Shorthand III (5). Pr., MN 211 with grade of C.**
Continuation of Shorthand II with emphasis on dictation speed and development of pretranscription skills.

300. **Transcription I (5). Lec. 5, Lab. 5. Pr., MN 212 with grade of C or equivalent.**
Development of transcribing skills progressing from transcription of printed shorthand to mailable transcription of unfamiliar material dictated at progressively higher rates of speed. Continuation of shorthand speed building 100 to 120 wam.
301. **Transcription II (5). Lec. 5, Lab. 5. Pr., MN 300 with grade of C.**
Terminal course. Emphasis on high quality transcripts evaluated according to transcription rate and speed of dictation. Shorthand speed 120 to 140 wam.
305. **Records Management (3). Pr., junior standing.**
Basic procedures of filing, records storage and control. Practice in record keeping.
400. **Office Machines (5). Lec. 5, Lab. 5. Pr., junior standing or consent of instructor and ability to type at a reasonable speed.**
Designed to give a working knowledge of various machines found in modern offices. Basic training in use of dictating and transcribing, duplication, adding, calculating, and posting machines.
402. **Office Apprenticeship (5). Lab. 10. Pr., MN 301, MN 403 or MN 404, and junior standing (open to OA majors only).**
Practical secretarial experience. Student spends two hours each day working as intern in an office to which assigned for actual office experience.
403. **Secretarial Procedure I (5). Pr., MN 300 and junior standing.**
Analysis of the secretarial profession stressing importance of personal factors, development of decision-making ability, study of specialized duties including those of public relations.
404. **Secretarial Procedure II (5). Pr., MN 300 and junior standing.**
Continuation of Secretarial Procedure I with study of important areas of preparation for the prospective administrative assistant, including preparation of reports using basic knowledge of data processing and statistics, financial and legal duties, and duties of supervision. Case studies.
405. **Administrative Management (5). Pr., MN 310 or MN 400 or consent of instructor, junior standing.**
Administrative organization, systems design, data collection and processing methods, communications and records management, office physical facilities, office performance standards and control, motivation of office personnel.

Marketing and Transportation (MT)

Professor Horton, *Head*

Associate Professors Adams, Davis, and Henley

Assistant Professor Reed

Instructors Harris and Watkins

331. **Principles of Marketing (5). Pr., EC 202.**
A general but critical survey of the field of marketing covering marketing channels, functions, methods and institutions.
432. **Promotional Strategy (5). Pr., MT 331, junior standing.**
An investigation into the problems of persuasive marketing strategy. Promotional objectives, methods of implementing these objectives, and the approaches in which the methods might be blended will be analyzed.
433. **Retail Store Management (5). Pr., MT 331, junior standing.**
Principles and practices involved in the scientific operation of the retail store. Store location, layout, buying, pricing, and merchandise control.
434. **Purchasing (5). Pr., MT 331, junior standing.**
Objectives, control, and the direction of industrial purchasing.
435. **Marketing Problems (5). Pr., MT 331, junior standing.**
Marketing problems, policies, costs, channels of distribution, terminal markets, trade barriers and legislation.
436. **Marketing Research Methods (5). Pr., MT 331, junior standing.**
Methods of scientific research in the field of marketing and their application to the solution of marketing problems.
437. **Sales Management (5). Pr., MT 331, junior standing.**
Principles and practices of sound organization and administration of sales organization. Includes consideration of: sales department organization, selecting, training, compensating, and supervising sales planning, setting up sales territories and quotas and other problems.
438. **Marketing Channel Systems (5). Pr., MT 331, junior standing.**
An investigation into the nature and role of marketing channels and intermediaries. Major marketing strategy problems such as designing channel objectives and constraints, distinguishing major channel alternatives, and motivating, evaluating, and controlling channel members will be analyzed.
440. **International Marketing (5). Pr., MT 331, junior standing.**
An examination of management problems in adapting the marketing process of the domestic firm to international operations; and the institutional structure that exists to service foreign markets and the practice of marketing administration by firms operating within these markets.

441. **Consumer Analysis (5).** Pr., MT 331, PG 211, and SY 201, junior standing.
Analysis of the consumer buying process as it is affected by environmental and institutional forces and development of market strategies which recognize these factors.
472. **Economics of Transportation (5).** Pr., EC 200, junior standing.
The development of systems of transportation. Rates are studied as they affect agriculture, commerce, and industry. Attention is also given to government regulation of transportation agencies.
473. **Logistics Management (5).** Pr., junior standing MT 472 or instructor's approval.
Fundamentals of traffic control in the transportation operations of business and industrial concerns.
475. **Transportation and Regulated Industries (5).** Pr., junior standing, MT 472 or instructor's approval.
Economic, legislative, and administrative problems related to regulation of transportation and utility rates and services.
476. **Motor Transportation (5).** Pr., junior standing, MT 472 or instructor's approval.
Economics of the motor transportation business with emphasis on freight and passenger carriers and the highway system. Particularly designed for students of business and of civil engineering.
490. **Special Problems in Marketing and Transportation (1-10).** Pr., MT 331 and senior standing.
Qualified students are given an opportunity to conduct investigations of special problems in Marketing and Transportation on an individual basis under the direction of a faculty member. (May be repeated for a maximum of 10 hours credit.)

GRADUATE COURSES

650. **Seminar (1-10).** Pr., graduate standing or consent of instructor.
For those students engaged in intensive study and analysis of marketing and transportation problems.
690. **Special Problems (1-5).**
Variable content in the marketing and transportation areas.
699. **Research and Thesis.** Credits to be arranged.

Materials Engineering (MTL)

This curriculum is administered by the Department of Mechanical Engineering. Materials Engineering courses are listed by cooperating academic departments; refer to the description of the curriculum under Mechanical Engineering in the section on The School of Engineering for required and elective courses.

Mathematics (MH)

Professors Burton, Head, Ball, Butz, B. Fitzpatrick, P. Fitzpatrick, Haynsworth, Ikenberry, Parker, Perry, and E. Williams

Associate Professors Baskerville, Bennett, J. Brown, Calder, Coleman, J. Ford,

R. Ford, C. Reed, Robinson, Thompson, and Transue

Assistant Professors S. Brown, Day, Hinrichsen, Lindner,

Robertson, and Zenor

Instructors Hartwig, Humphreys, Murphy, Petranka, Straley,

Wall, and N. Williams

100. **Mathematical Insights (5).**
For students in the arts or humanities. The purpose of this course is to give such students insight into the nature of mathematics by engaging them in mathematical thought processes within a suitable elementary framework. Prior credit for any other University mathematics course precludes credit for this course.
151. **Finite Mathematics (5).** Pr., MH 159 or MH 160.
Selections from elementary combinatorial analysis, probability theory, linear algebra, linear programming. Designed for students in the School of Business and not open, except by special permission of the Department of Mathematics, to students in Engineering or to Mathematics or Physics majors.
159. **Pre-Calculus Without Trigonometry (5).**
Preparation for MH 161 but not MH 162. Emphasizes algebraic techniques, coordinate geometry, functions and relations and their graphs. Students who need a precalculus foundation which emphasizes trigonometry should take MH 160.
160. **Pre-Calculus With Trigonometry (5).**
Basic analytic and geometric properties of the algebraic and trigonometric functions. Prepares students for MH 161. Credit will not be allowed for both MH 159 and MH 160.

161. **Analytic Geometry and Calculus (5). Pr., MH 159 or MH 160.**
- 162-163. **Analytic Geometry and Calculus (5-5). Pr., MH 160 and MH 161.**
A continuation of MH 161.
247. **Foundations of Plane Geometry (3). Pr., MH 163.**
Axiomatic development of a plane geometry. Points, lines, congruences. Emphasis is placed on development of proofs by students.
264. **Analytic Geometry and Calculus (5). Pr., MH 163.**
A continuation of MH 161-162-163. Infinite series, partial derivatives, multiple integrals.
265. **Linear Differential Equations (3). Coreq., MH 264.**
First and second-order linear differential equations including the solution of such equations by infinite series.
266. **Topics in Linear Algebra (3). Pr., MH 163.**
Linear spaces, vector spaces, linear transformations, matrices and determinants. Not open to students who have credit for MH 333 or MH 405 or MH 437.
267. **Introductory Probability and Statistics (5). Coreq., MH 161.**
Designed for students whose fields require a basic knowledge of probability and for those who plan to take upper level courses in probability and statistics. Conditional probability, independence and random variables with emphasis on discrete random variables.
- 281-282-283. **Elementary Mathematics (5-5-3). Pr., sophomore standing.**
These courses provide appropriate mathematical insights for elementary school teachers. Emphasis is on the structure of the number systems, the basic concepts of algebra and informal geometry. Open for credit only to students in Elementary Education, except by special permission of the Department of Mathematics.
310. **Introduction to Calculus of Variations (3). Pr., MH 265 or consent of instructor.**
Fundamental concepts of extrema of functions and functionals; the simplest problem of the calculus of variations; first and second variations; generalizations of the simplest problem; sufficient conditions; constrained functionals and isoperimetrical problems; general Lagrange problem.
- 331-332-333. **Introduction to Modern Algebra I, II, III (5-5-5). Pr., MH 163.**
Sets, mapping, the integers, isomorphisms, and homomorphisms; groups, rings, fields, ideals; factorization problems, Euclidean domains, extension, fields, vector spaces.
362. **Engineering Mathematics I (3). Pr., MH 265.**
Fourier Series, partial differential equations, special functions.
401. **The Calculus of Vector Functions (3). Pr., MH 266 or consent of instructor; junior standing.**
Derivative and integral of vector functions, gradient, divergence, curl, Green's Theorem, Stokes Theorem.
403. **Engineering Mathematics II (5). Pr., MH 265; junior standing.**
Complex numbers, functions, mappings, residues, contour integration.
405. **Matrix Theory and Applications (5). Pr., MH 266 or MH 333; junior standing.**
Canonical forms, determinants, linear equations, characteristic value problems.
406. **Elementary Partial Differential Equations (5). Pr., MH 265 or MH 428; junior standing.**
First and second order linear partial differential equations with emphasis on the method of eigenfunction expansions.
407. **Introduction to Celestial Mechanics (5). Pr., consent of instructor; junior standing.**
Dynamics of a particle, two-body problem, coordinate transformations, series expansions in elliptic motion, introduction to general perturbation theory.
- 411-412. **Introduction to Calculus of Variations (3-3). Pr., MH 310 or consent of instructor; junior standing.**
Classification of boundary conditions; equivalence of the general problem of Lagrange and the Maier and Bolza problems; classical and Hamiltonian formulation of the Bolza problem; the maximum principle; numerical solution of two-point boundary value problems; current problems.
414. **Applied Algebra (5). Pr., MH 405 or departmental approval, junior standing.**
Sets and relations, groups, group codes, group representations.
418. **Analysis for Applied Mathematics (5). Pr., MH 265, 266; junior standing.**
Linear functions and transformations, concepts of the calculus including uniform continuity and uniform convergence, curves, series of functions, complex differentiation and differential equations. Designed primarily for students in engineering, physical sciences and applied mathematics who are likely to pursue more advanced work. Not open for credit to students in the MH curriculum.
- 420-421-422. **Analysis I, II, III (5-5-5). Pr., MH 264; junior standing.**
The real number system, theorems concerning number sets, sequences, graphs of functions; Riemann-Stieltjes integration, continuity, the derivative and functions of bounded variation; functions whose domains are in Euclidean spaces.
- 428-429. **Linear Differential Systems (3-3). Pr., MH 422 or consent of instructor; junior standing.**
Systems of linear ordinary differential equations, series solutions, approximate solutions.

431. **Modern Algebra (5).** Pr., one junior-senior level course in algebra. Integral domains, groups, rings, fields.
437. **Linear Algebra (5).** Pr., MH 333 or MH 431; junior standing. Linear transformations, matrix algebra, finite-dimensional vector spaces.
- 441-442. **Geometry, A Modern View I, II (5-5).** Pr., MH 163; junior standing. A development of geometry using the real number system and measurement as proposed by G. D. Birkhoff. The course moves rapidly, with definitions and proofs, through the foundations of geometry and into the main body of geometric theory.
443. **Linear Geometry (5).** Pr., MH 163; junior standing. Transformations in projective, affine, and Euclidean planes.
444. **Combinatorial Geometry in the Plane (5).** Pr., MH 163; junior standing. Helly's and related theorems.
- 450-451. **Metric Spaces (3-3).** Pr., MH 421 or consent of instructor; junior standing. The elementary properties of metric spaces with special attention to the line and the plane.
460. **Introduction to Numerical Analysis (5).** Pr., MH 265 or MH 428, junior standing; a knowledge of an algorithmic computer language available at the Computer Center.†
Polynomial approximation, numerical differentiation and integration, solution of ordinary differential equations (initial value problems) error analysis.
461. **Numerical Matrix Analysis (5).** Pr., MH 266 or MH 333; junior standing; a knowledge of an algorithmic computer language available at the Computer Center.†
Numerical solution of algebraic equations and of systems of linear equations, solution of boundary value problems, numerical calculation of characteristic values and vectors, error analysis.
464. **Probability Theory (5).** Pr., MH 420 or consent of instructor; junior standing. Complete probability fields, probability functions, random variables, convergent sequences of random variables, conditional probability, distribution functions, various applications.
467. **Mathematical Statistics I (5).** Pr., MH 163; junior standing. Descriptive statistics, elementary probability and sampling theory, least squares and correlation.
468. **Mathematical Statistics II (5).** Pr., MH 467; junior standing. Chi-square test, best estimates, small sample theory, analysis of variance, non-parametric methods.
- *480. **Mathematics of Computation (5).** Pr., one course above MH 163; junior standing. Various numerical methods of problem solution; programming these methods using an algebraic compiler.
- *485. **Fundamentals of Algebra I (5).** Pr., one course above MH 163; junior standing. The structure of the integers, factorization of the integers, congruent theory.
- *486. **Foundation of Geometry (5).** Pr., one course above MH 163; junior standing. Euclidean and non-Euclidean geometries with emphasis given to their logical development from basic assumptions. Some attention given to the history of geometry.
- *487. **Fundamentals of Analysis (5).** Pr., one course above MH 163; junior standing. A study of mathematical analysis with emphasis on basic principles and relationships. (Not for majors in science and mathematics.)
491. **Special Problems (1-5).** Pr., consent of instructor; junior standing. Not open to graduate students. An individual problems course. Each student will work under the direction of a staff member on some problem of mutual interest.

GRADUATE COURSES

- 602-603. **Celestial Mechanics I, II (5-5).** Pr., MH 407 or consent of instructor. Elliptic motion, potentials of attracting bodies, numerical integration and differential correction of orbits, lunar theory, theory of perturbations, Lagrange's method and introduction to canonical variables, the disturbing function, artificial satellite orbit theory.
- 607-608-609. **Applied Mathematics I, II, III (5-5-5).** Pr., approved graduate standing. Scalar, vector, and dyadic fields; equations governing fields; Helmholtz's and Laplace's equations in curvilinear coordinates; separation of variables; boundary conditions and eigenfunctions; Green's functions.
610. **Special Functions (5).** Pr., consent of instructor.
613. **Tensor Analysis (5).** Pr., consent of instructor.
- 620-621. **Functions of Real Variables I, II (5-5).** Pr., departmental approval. Measure theory and Lebesgue Integration.

†This information can be obtained by taking IE 204.

*Not available to graduate students in the areas of science or mathematics.

- 622-623. **Functions of a Complex Variable I, II (5-5).** Pr., departmental approval.
Complex numbers; analytic functions; derivatives, Cauchy integral theorem and formula; Taylor and Laurent series; analytic continuation; residues; maximum principle; Riemann surfaces; conformal mapping; families of analytic functions.
- 624-625-626. **Normed Linear Spaces (5-5-5).** Pr., departmental approval.
Bounded linear transformations and linear functionals on Banach and Hilbert spaces, including conjugate spaces, adjoint operators, self adjoint operators; spectral theory, applications to particular spaces.
- 628-629. **Advanced Theory of Differential Equations (5-5).** Pr., departmental approval.
Existence, uniqueness and continuation theorems for ordinary and partial differential equations; nature of solutions. The first quarter will be devoted to ordinary equations, the second to partial differential equations.
- 631-632. **Modern Algebra I, II (5-5).** Pr., departmental approval.
Numbers; sets; groups; rings; fields of polynomials; Galois theory.
633. **Theory of Groups (5).** Pr., MH 631.
Sylow theory, abelian groups, chain conditions.
634. **Theory of Rings (5).** Pr., MH 632 or departmental approval.
Structure of rings, ideals in commutative rings.
- 637-638-639. **Matrices (5-5-5).** Pr., MH 437.
Special types of matrices; reduction to canonical form; function of matrices; readings in current literature.
- 640-641-642. **Functional Analysis (5-5-5).** Pr., MH 626 or consent of instructor.
Topics in the advanced theory of linear functionals and operators on Banach and Hilbert spaces, chosen to lead students into research work in this field.
- 645-646. **Differential Geometry I, II (5-5).** Pr., departmental approval.
Tensor analysis; curves and surfaces in Euclidean space; introduction to Riemannian geometry of n -dimensions.
- 650-651-652. **General Topology (5-5-5).** Pr., consent of instructor.
An axiomatic development of point-set topology; connectivity, compactness, separability, topological equivalence, well-ordering, inner limiting sets, Cartesian products.
653. **Dimension Theory (5).** Pr., consent of instructor.
The topological study of dimension in separable metric spaces.
- 654-655-656. **Point-Set Topology (5-5-5).** Pr., MH 652.
Upper semi-continuous collections, indecomposable continua, metrization problems, inverse limits, other topics.
- 657-658. **Algebraic Topology (5-5).** Pr., consent of instructor.
The fundamental group, homology and cohomology groups, simplicial complexes, other topics.
661. **Advanced Numerical Analysis (5).** Pr., MH 461, and MH 265 or MH 428.
Numerical solution of partial differential equations.
667. **Mathematical Statistics II (5).** Pr., MH 468 or consent of instructor.
Advanced probability and sampling theory, advanced regression and correlation, analysis of variance, Monte Carlo method, factor analysis.
668. **Mathematical Statistics III (5).** Pr., MH 667.
Estimation, experimental design, non-parametric methods, sequential analysis, game theory, linear programming, covariance techniques.
670. **Uniform Spaces (5).** Pr., MH 652 and consent of instructor.
Uniform spaces, uniform topology, uniformly continuous functions, completions of uniform spaces, other topics.
- Note: Courses 683 through 688 listed below are for Education majors and are not available to graduate students in science or mathematics. They are offered in summer only.
683. **Number Systems (5).** Pr., MH 485 and approved graduate standing.
Detailed construction of the number system with close attention paid to the logic employed. This course is intended to furnish the high school teacher with a thorough understanding of the number system and its role in high school algebra and analysis.
685. **Fundamentals of Algebra II (5).** Pr., MH 485 and approved graduate standing.
Number fields, including the fields of rational, real, and complex numbers; the algebra of polynomials over a field; factorization of polynomials; and theory of equations.
686. **Fundamentals of Algebra III (5).** Pr., MH 685.
Continuation of MH 685.
687. **Fundamentals of Analysis II (5).** Pr., MH 487.
Continuation of MH 487 with the introduction of more sophisticated ideas, e.g., the completeness axiom, continuity and inverse functions.
688. **Fundamentals of Analysis III (5).** Pr., MH 687.
Continuation of MH 687.
691. **Directed Reading in Algebra (Credit to be arranged.)** Pr., 10 hours of 600 courses in the area.

- 692. Directed Reading in Analysis. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 693. Directed Reading in Applied Mathematics. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 694. Directed Reading in Geometry. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 695. Directed Reading in Topology. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 696. Directed Reading in Matrix Theory. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 697. Directed Reading in Numerical Analysis. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
- 699. Research and Thesis. (Credit to be arranged.) May be repeated for credit.
- 799. Research and Dissertation. (Credit to be arranged.)

Mechanical Engineering (ME)

Professors Vestal, *Head*, Barbin, Bussell, Jemian, Jones, *Assistant Head*, Maynor,
Shaw, Swinson, Tanger, and Vachon
Associate Professors Cooley, Dyer, Fluker, Leppert, Maples, Reece,
Scarborough, Smith, Wilcox, and Yu
Assistant Professors Dunn, Goodling, and Ranson

Visiting Lecturer Touloukian

- 202. Engineering Materials Science—Structure (3). Pr., CH 103, PS 220, or PS 205.
Theories and structures of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion and phase transformations.
- 205. Applied Mechanics—Statics (4). Coreq., MH 264 and PS 220.
Resolution and composition of forces; equilibrium of force systems; friction; second moments.
- 207. Strength of Materials I (3). Pr., ME 205 and MH 264, coreq., MH 265.
Fundamentals of stress and strain; stress-strain relations; temperature effects; bar with axial force; thinwall cylinders; torsion.
- 210. Engineering Method (1). Coreq., PS 222.
A rational approach to the solution of engineering problems, treating the relationship between analysis and experiments, including a review of basic postulates and analytical models, with applications in various areas. (Students with credit in PN 103 may not take this course for credit.)
- 301. Thermodynamics I (4). Pr., MH 264 and PS 220.
Laws of thermodynamics; energy transformations; properties and relationships among properties; equations of state and simple processes and cycles.
- 302. Thermodynamics II (3). Pr., ME 301.
Thermodynamic analysis of real and ideal cycles, and concepts of compressible fluid flow.
- 303. Thermodynamics III (3). Pr., ME 301.
Property determination, Maxwell's relations, thermodynamics of mixtures, combustion, and chemical equilibrium.
- 304. Engineering Materials Science—Properties (3). Pr., ME 202, ME 207.
Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and poly-crystals, and properties of composite materials.
- 308. Computation Laboratory (2). Lec. 1, Lab. 3. Pr., MH 265.
Application of analog and digital programming in Mechanical Engineering.
- 309. Materials Testing Laboratory (1). Lab. 3. Coreq., ME 308 and ME 316.
Applications of principles in solid mechanics.
- 310. Thermodynamics (5). Winter. Pr., MH 163 and PS 206 or equivalent.
Gases and vapors; cycles; mass and heat transfer. Open to non-Mechanical Engineering students only.
- 312. Measurements Laboratory (3). Lec. 2, Lab. 3. Pr., ME 308 and ME 340.
The theory and practice of engineering measurements, including treatment of experimental data and the design of experiments.
- 316. Strength of Materials II (4). Pr., ME 207, coreq., ME 309.
Beams; thick wall cylinders; theories of failure; energy.
- 321. Dynamics I (4). Pr., ME 205, coreq., MH 265.
Kinematics of points, lines, and rigid bodies; relative motion and coordinate transformations; kinetics; conservation of energy and momentum.

322. **Dynamics II (4).** Pr., ME 321, coreq., MH 266.
Matrix methods in kinematics; introduction to celestial mechanics; Euler's equations of motion; the inertia tensor; gyroscopic motion.
323. **Dynamics of Machines (4).** Lec. 3, Lab. 3. Pr., ME 207, ME 308, ME 322.
Analysis of rotating systems. Dynamic force analysis of mechanisms and complexes of mechanisms. Oscillating system.
335. **Engineering Materials Science—Physical Metallurgy (4).** Lec. 3, Lab. 3. Pr., ME 304.
Relationship between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations.
336. **Physical Analysis of Materials I (4).** Lec. 3, Lab. 3. Pr., ME 335.
The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students.
337. **The Physical Analysis of Materials II (4).** Lec. 3, Lab. 3. Pr., ME 336.
The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed.
338. **Phase Diagrams (4).** Lec. 3, Lab. 3. Pr., ME 335, CH 412.
Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-composition systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics.
340. **Fluid Mechanics I (3).** Pr., ME 207, ME 301 and ME 321.
Fluid properties; fluid statics; fluid kinematics; integral forms of conservation laws—applications to exterior and interior flows; dimensional analysis.
341. **Fluid Mechanics II (4).** Pr., ME 340, coreq., ME 302, ME 322.
Potential theory; vorticity; stream functions; viscous flow; boundary layers; turbulent flow.
401. **Statistical Thermodynamics (3).** Pr., ME 301 or departmental approval and junior standing.
Fundamental laws of thermodynamics and thermodynamic properties from the microscopic point of view.
402. **Introduction to Optimal Systems (4).** Pr., MH 310 and junior standing.
Application of optimal criteria to engineering problems.
414. **Turbomachines (4).** Pr., ME 341 or departmental approval and junior standing.
Applications of fluid mechanics to turbomachines, such as pumps, compressors, turbines, and fluid couplings, control devices.
415. **Thermodynamics of Power Systems (4).** Pr., ME 302, ME 303, ME 341. Coreq., ME 421 or departmental approval and junior standing.
Design and analysis of static and dynamic thermal power systems.
420. **Thermal Systems Laboratory (2).** Lec. 1, Lab. 3. Pr., ME 312, coreq., ME 415.
Selected experiments on thermal systems evaluation.
421. **Heat Transfer (4).** Pr., ME 340, EE 262, MH 265, or departmental approval and junior standing.
Fundamental principles of heat transfer by steady and unsteady conduction, thermal and luminous radiation, boiling and condensation, free and forced convection.
422. **Transport Processes (3).** Pr., ME 421 or departmental approval and junior standing.
Transport processes involving mass, momentum, and energy transfer combined with heat and mass transfer in chemical reacting boundary layers.
425. **Gas and Steam Turbines (4).** Pr., ME 302, ME 341, and senior standing.
Thermodynamic theory and design of nozzles and blades for gas and steam turbines.
427. **Dynamics of Physical Systems (4).** Pr., ME 323, ME 340 and junior standing.
Motion of systems represented by first and second order differential equations. Transient types and response of physical systems. Transfer functions.
428. **Air Conditioning and Refrigeration (4).** Pr., ME 302, ME 421 and junior standing.
Theory and design of heating, cooling and ventilating systems, and refrigeration systems, including cryogenics.
432. **Automatic Controls (3).** Pr., MH 265, ME 341, ME 427 and junior standing.
Control systems fundamentals. Systems analysis techniques. Applications to machine and process control.
434. **Fluid Mechanics and Heat Transfer (5).** Spring. Pr., ME 310.
Mechanics of compressible and incompressible fluids; transmission of heat by conduction, convection, and radiation. Open to non-Mechanical Engineering students only.
436. **Engineering Materials Science—Ferrous Metallurgy (3).** Pr., ME 335, and junior standing.
Design of ferrous metals following modern theory and practice. Hardenability, alloying, deformation, and special purpose steels.

437. **Engineering Materials Science—Nonferrous Metallurgy (3).** Pr., ME 335 and junior standing.
Design of nonferrous metals following modern theory and practice. Aluminum and copper-beryllium systems, corrosion resistant alloys, refractory metals, strengthening mechanisms, spacecraft environments.
438. **Residual Stresses in Metals (3).** Pr., ME 335, and junior standing.
Production and measurement of residual stresses in metals; relation of residual stresses to fatigue; consideration of fatigue in design.
439. **Mechanical Engineering Design I (4).** Lec. 3, Lab. 3. Pr., ME 323; coreq., ME 335, ME 427.
Design of machine elements for static and dynamic stresses with the emphasis on synthesis and creative design.
440. **Mechanical Engineering Design II (3).** Lec. 2, Lab. 3. Pr., ME 316, ME 439, or departmental approval and senior standing.
The solution of typical engineering systems problems by group or team effort, requiring the development of skill and co-operation in the use of analysis, synthesis, creative design and optimization.
441. **Engineering Systems (credit 1-5).** Pr., senior standing and departmental approval.
May be taken more than one quarter, but total credit may not exceed 10 quarter hours.
Mechanical Engineering design problems requiring the development of skill in the use of analysis, synthesis and creativeness in the design of engineering systems.
442. **Computer Aided Design (3).** Pr., ME 427 or departmental approval and junior standing.
The computer in design. Batch and Interactive processing. The use of typewriter and visual display remote terminals in the development and operation of design systems.
443. **Photoelastic Stress and Strain Analysis (3).** Pr., ME 207 and junior standing.
Theory of the polariscope; two- and three-dimensional model making and preparation; techniques of data collection and photoelectric models and analysis.
444. **Design for Hazard Reduction (4).** Pr., ME 207, ME 321.
Relationships of the mechanics of machinery and the properties of materials which lead to the design principles of hazard reduction in machines and machine systems. Open to non-Mechanical Engineering students only.
446. **Advanced Physical Metallurgy—Theoretical Metallurgy (3).** Pr., ME 335, CH 408, PS 222.
The physical properties of metals in relation to the modern theories of metals.
447. **Advanced Physical Metallurgy—Plasticity (4).** Lec. 3, Lab. 3. Pr., ME 335, ME 316.
The macro- and micro-processes involved in the plastic deformation of metals. Slip, twinning, dislocation theory, creep, fatigue, impact, high velocity deformation, and other plastic deformation processes will be studied in relation to current knowledge.
448. **Introduction to Ceramics (3).** Pr., ME 335.
The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included.
450. **Special Problems. (Credit 1-5.)** Pr., Department Head approval, junior standing.
Individual student endeavor under staff supervision involving special problems of an advanced nature.
451. **Advanced Projects (3).** Lec. 1, Lab. 6. Pr., ME 421, ME 341, coreq., ME 440, and senior standing.
Individual projects of a current nature, involving both analysis and synthesis, culminating in a formal report.

GRADUATE COURSES

604. **Advanced Thermodynamics I (3).** Pr., ME 303 and graduate standing.
Classical thermodynamics of reactive and nonreactive systems; applications.
605. **Advanced Thermodynamics II (3).** Pr., ME 604.
Statistical treatment of the laws and properties of thermodynamic systems; applications.
606. **Propulsion Systems (4).** Pr., departmental approval.
Chemical systems including liquid and solid rocket engines; thermionic engines and ionic propulsion; plasma and nuclear propulsion systems.
607. **Energy Conversion Systems (3).** Pr., ME 605, PS 320 or departmental approval.
A review of quantum mechanics and irreversible thermodynamics; study of direct energy converters, viz., thermoelectric, photovoltaic, thermionic and magnetohydrodynamic generators and fuel cells.
608. **Advanced Thermodynamics III (3).** Pr., ME 605.
Thermodynamics of nonequilibrium processes.

- 620. Heat Transmission—Conduction (3). Pr., ME 421, MH 362 or departmental approval.**
Formulations and solutions of steady, steady periodic, and unsteady heat conduction problems.
- 621. Heat Transmission—Convection (3). Pr., ME 421.**
General problems of convection, forced convection heat transfer, free convection, thermodynamic boundary layers, condensing and boiling, heat transfer to liquid metals and analysis of heat exchangers.
- 622. Heat Transmission—Radiation (3). Pr., ME 421.**
Fundamental laws of radiation, net radiation methods, configuration factors, radiation through absorbing media, solar, terrestrial and celestial radiation, and thermometry and temperature control.
- 630. Advanced Strength of Materials (3). Pr., ME 316, MH 362 or departmental approval.**
Stress and strain analyses of curved beams and beams on elastic foundations; energy methods; selected topics from the literature; stress and strain analyses in bars of non-circular section subjected to torsion.
- 631. Theory of Elasticity I (3). Pr., departmental approval.**
Theory of stress and strain and stress-strain relations. Laws of balance in momentum, moment of momentum, and energy. Solution by tensor stress function and displacement functions.
- 632. Theory of Elasticity II (3). Pr., ME 631.**
Continuation of solutions by potential functions. Solutions of two dimensional problems by Kolosov-Muskhelishvili methods.
- 633. Experimental Stress Analysis (3). Pr., ME 316.**
Stress analyses by experimental techniques including transmission and scattered light photoelasticity; strain gages, brittle coatings, photoelastic coatings. Moiré patterns are developed.
- 634. Elastic Stability (3). Pr., ME 631 or departmental approval.**
Stability of conservative and nonconservative systems. Buckling of slender bars and thin-walled cross-sections; buckling of plates and shells. Buckling loads by Rayleigh-Ritz, Galerkin, and Kantorovich methods.
- 635. Intermediate Dynamics (3). Pr., ME 340, MH 362.**
Dynamics of particles and systems of particles applied to engineering problems. Work and energy, and impulse and momentum principles. LaGrange's equations and Hamilton's principle.
- 636. Non-Linear Oscillations (3). Pr., ME 427 or departmental approval.**
Method of phase plane to linear systems. Self-excited and relaxation oscillations. Routh-Hurwitz and Liapunov criteria on stability. Introduction to asymptotic method to non-linear oscillations.
- 637. Theory of Plates (3). Pr., ME 631.**
Analyses of plates of various shapes under transverse and in-plane loadings with different boundary conditions. Buckling of plates due to in-plane loadings. Introduction to von Karman large deflection theory.
- 638. Theory of Shells (3). Pr., departmental approval.**
Introduction to differential geometry. Development of governing equations for shells under arbitrary loading. Shallow shell theory with applications. Asymptotic method for solution of differential equations in shell theory.
- 639. Variational Mechanics (3). Pr., departmental approval.**
The problem of Bolza, Mayer and LaGrange with fixed and variable end points; Hamilton's principle and LaGrange's equations; energy method; Rayleigh's principle and Rayleigh-Ritz method; Galerkin method; variational methods; applications.
- 640. Fluid Dynamics (3). Pr., MH 362 and graduate standing.**
Navier-Stokes Equations. Exact and approximate solutions. Euler's equations. Continuity. Energy equations. Irrotational flow.
- 641. Boundary Layer Theory (3). Pr., ME 640.**
Hydrodynamic and thermal boundary layers. Prandtl's equations, integral relations and approximate techniques.
- 642. Gas Dynamics I (3). Pr., ME 640.**
Compressible flow equations; isentropic flow; Fanno line flow; Rayleigh line flow; shock waves; high speed flow; internal and external flows; forces on immersed bodies.
- 643. Gas Dynamics II (3). Pr., ME 642 and ME 605.**
Continuation of ME 642 with emphasis on real gas effects and non-equilibrium flow.
- 644. Turbulence (3). Pr., ME 641.**
Analysis of wall-affected and free turbulent flows.
- 660. Structure and Properties of Solids (3). Pr., departmental approval.**
Denominations of structure are considered, via an interdisciplinary approach, from the viewpoint of providing a fundamental insight with respect to the genesis of selected macroscopic properties.

661. **Corrosion: Fundamentals and Applications (3). Pr., departmental approval.**
Nature and mechanisms of corrosion. Effects of: material-manufacturing methods, construction and environment. Corrosion types and methods of corrosion control.
662. **Performance of Metals at Elevated Temperatures (3). Pr., departmental approval.**
Fundamental behavior of metals at elevated temperatures. Commercial and experimental types of ferrous and nonferrous alloys and their suitability for elevated temperature applications.
663. **X-Ray Metallography (3). Pr., ME 335 and MH 362.**
The principles of X-ray absorption and diffraction and application to the study of metals and other crystalline materials.
665. **Strengthening of Metals (3). Pr., ME 335.**
A treatment of the six basic mechanisms by which metals are strengthened. Emphasis is placed on causative factors and accompanying manifestations.
666. **Plasticity of Metals (3). Pr., ME 335.**
A quantitative treatment of: the minimization of plastic flow, by means of design consideration, where the phenomenon is associated with deleterious effects; the maximization of plastic flow, by means of material-condition and forming method considerations, where the objective is to form or shape.
667. **Dislocation Theory (3). Pr., departmental approval.**
The nature and properties of dislocations including crystal structure and imperfections, dislocation geometry in both ideal and real crystals, dislocation configurations, multiplication and interactions with various imperfections, and methods of observation.
675. **Planar Mechanisms (3). Pr., ME 323.**
Analysis of simple and complex planar mechanisms. Synthesis by finite displacement and infinitesimal motion methods.
676. **Spatial Mechanisms (3). Pr., ME 675.**
Analysis and synthesis of spatial mechanisms.
677. **Selected Topics in Mechanical Design (3). Pr., ME 630 and ME 675.**
Dynamic properties of trains of mechanisms; hydrostatic and hydrodynamic lubrication; thermal equilibrium; wear and fatigue problems; design techniques involving computers.
690. **Seminar (credit to be arranged). May be taken more than one quarter.**
691. **Directed Reading in Mechanical Engineering (credit to be arranged). May be taken more than one quarter.**
692. **Engineering Analysis (3). Pr., departmental approval.**
Study of equilibrium, eigenvalue, and propagation problems for continuous systems. Physical laws and mathematical properties discussed with considerable emphasis on numerical solutions.
693. **Experimental Research Methods (3). Pr., departmental approval.**
Numerical methods and data processing, mathematical statistics and probability, analysis of experimental data, errors of measurement, and instrumentation.
694. **Fluid Machines (3). Pr., ME 642.**
Similarity considerations; cavitation; cascade theory; axial and radial flow machines.
699. **Research and Thesis (credit to be arranged). May be taken more than one quarter.**
799. **Research and Dissertation (credit to be arranged). May be taken more than one quarter.**

Military Science (MS)

BASIC COURSE

First Year (Freshman)

Military Science I

101. **Orientation; History, Mission and Organization of the ROTC Program, Mechanical Training, M1 Rifle; Military/Civilian Obligations; US Army Reserves and National Guard; Definition and Causes of War; Evolution of Weapons and Warfare (1). Lec. 1, Leadership Lab. 1.**
102. **Principles of War; Factors of National Power; National Objectives, Policies, Strategies and Instruments; Organization and Mission of the Armed Forces (1). Lec. 1, Leadership Lab. 1.**
103. **Marksmanship; Range Firing; Organization, Mission and Capabilities of the Army (1). Lec. 1, Leadership Lab. 1.**

Second Year (Sophomore)

Military Science II (Pr., MS I or as determined by the Professor of Military Science).

201. American Military History (1). Lec. 2, Leadership Lab. 1.

The origins of the American Army to the present with emphasis on factors which led to the organizational, tactical, logistical, operational, strategic, social, and similar patterns found in the present day Army.

202. Introduction to Tactics and Operations (Map and Aerial Photograph Reading) (1). Lec. 2, Leadership Lab. 1.

Application of basic principles, emphasizing terrain appreciation and evaluation; marginal information; military and topographic map symbols; orientation; intersection; resection; military grid reference system; classes of aerial photography and elementary aerial photograph reading.

203. Introduction to Tactics and Operations (1). Lec. 2, Leadership Lab. 1.

Instruction in the basic military team; combat formations and patrolling; field fortification and camouflage, cover and concealment; technique of fire and principles of offensive and defensive combat.

ADVANCED COURSE

Third Year (Junior)

Military Science III (Pr., all MS I and MS II or equivalent as determined by Professor of Military Science).

301. Leadership and Management I (3). Lec. 4, Leadership Lab. 2.

An examination of theories, models and behavioral science information related to leadership and the application of these concepts in a military environment. Such contemporary leadership challenges as drug abuse, dissent, racial harmony and systems for practice and evaluation of leadership will be considered.

302. Fundamentals and Dynamics of the Military Team I (3). Lec. 4, Leadership Lab. 2.

Educational psychology as pertains to the three stage instruction process, principles and methods of military instruction; familiarization with the roles of the various branches in the overall mission of the Army; infantry small unit leader's estimate of the situation, planning and organizing for combat and execution of mission, fundamentals of offensive and defensive combat, and small unit operations.

303. Fundamentals and Dynamics of the Military Team I (3). Lec. 4, Leadership Lab. 2.

Leadership and management aspects of employing the rifle platoon and company in offensive and defensive combat.

Fourth Year (Senior)

Military Science IV (Pr., MS III or as determined by the Professor of Military Science).

401. Fundamentals and Dynamics of Military Team II (3). Lec. 4, Leadership Lab. 2.

Classification, functions, capabilities and organization of forces; command and staff relationships and functions; combat intelligence; principles of reconnaissance and security; impact of tactical operations on personnel and logistics management; code of conduct.

402. Fundamentals and Dynamics of Military Team II (3). Lec. 4, Leadership Lab. 2.

Organization for combat; the battlefield; principles of war; fundamentals of the application of force using the combined arms team (Infantry, Armor and Artillery) as the teaching vehicle; duties and responsibilities of company and battalion officers of the combat arms during tactical operations.

403. Leadership and Management II (3). Lec. 4, Leadership Lab. 2.

Army administration and management techniques and procedures; military law; laws of land warfare; inter-relationship of elements of national power; world change and military implications; customs of the service; responsibilities and obligations of an officer.

Music (MU)

Professors Hinton, Head, Glyde, Moore, Rosenbaum, Tamblin, Tyre, and Walls
Associate Professor Bentley

Assistant Professors Anderson, Lavore, Stephenson, Mickelsen, Howard, Timberlake,
Rawlins, Vinson, and Liverman

Instructors Colaianne, J. Kendrick, Goff, and Mayfield

100. **Music Convocation (0).** All quarters. Required of all music students each quarter.
Performance & lectures by faculty, guest artists, and students. Music & music education majors are expected to perform at the teacher's discretion and in accordance with departmental rules.
- 131-132-133. **Material and Organization of Music (5-5-5).**
A systematic study of harmony, counterpoint, form and style through the literature of music.
- 211-212. **Service Playing (1-1).**
Hymn playing, modulation, selected anthems and oratorio selections, simple improvisation and transposition.
- 231-232-233. **Material & Organization of Music (5-5-5). Pr., 133.**
Continuation of the study of Harmony, Counterpoint, Form and Style in music.
- 251-252-253. **Survey of Music Literature (1-1-1). Lec. and Lab. 3-3-3.**
Presentation of instrumental solo, opera and symphonic music, acquainting the student with musical compositions and composers with emphasis on music literature of the past three centuries.
311. **Liturgies (3).**
Liturgical worship service of Roman Catholic and Protestant churches, plus non-liturgical forms of other Protestant denominations.
312. **Hymnology (3).**
The musical significance of hymns of the Christian church from the earliest times to the present.
- 331-332-333. **Materials and Organization of Music (5-5-5). Pr., 233.**
Continuation of second year systematic study of harmony, counterpoint, form and style through the literature of music.
- 334-335-336. **Counterpoint I-II-III (3-3-3). Pr., MU 233.**
I. Strict Counterpoint. Counterpoint in 5 species in 2 or 3 voices concluding with invertible counterpoint. II. Tonal counterpoint. Contrapuntal devices of the 18th Century including double counterpoint and imitation. III. Invention and Fugue. The study and writing of 2 part inventions, canonic treatment, and the 3 voice fugue.
- 337-338-339. **Modern Harmony I, II, III (3-3-3). Pr., 233.**
Twentieth century harmonic devices. An integrated approach to understanding contemporary writing, with emphasis on original work and analysis of the principal departments from "traditional" harmony.
- 351-352-353. **Music History I-II-III (3-3-3).**
Development of music from early times to the present day. Lectures, recorded examples, readings.
- 361-362-363. **Conducting I-II-III (3-1-1). Pr., MU 133, MU 153.**
I. Elementary basic baton techniques and introduction to score reading. II. Choral conducting. Elementary course in choral score reading and conducting choir and glee clubs. III. Instrumental conducting. Elementary course in instrumental score reading and conducting band, orchestra and instrumental ensembles.
371. **Introduction to Music (3). Open to Elementary Education Majors only.**
The understanding of music including an explanation of basic terms, notations, rhythm, tonal system, vocal and piano score reading.
409. **Marching Band Techniques (3).**
Fundamental methods and procedures of the Marching Band.
414. **Care and Repair of Musical Instruments (1). Lec. 1, Lab. 3. Pr., senior standing.**
Selection, care and repair of woodwind, brass and string instruments with emphasis on adjustments which should be made by the instrumental director.
415. **Organ Literature and Design (3).**
Survey of organ literature correlating the forms of compositions and types of organs for which the music was written.
416. **Church Music Seminar (3). Pr., MU 311, 312, 361, 362, 415, or 442, or approval of instructor.**
The processes of establishing a complete Church Music program. Supervised directing of choral ensemble.
- 422-423-424. **Theory Review (3-3-3). No credit for Applied Theory Composition or Pedagogy Majors.**
Harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.
- 431-432-433. **Music Analysis (3-3-3). Pr., MU 253 and MU 233.**
Harmonic and structural analysis of smaller instrumental forms; harmonic and structural analysis of the larger polyphonic and homophonic forms.
- 434-435-436. **Music Composition I-II-III (3-3-3). Pr., MU 233.**
Analysis, study, and writing of musical compositions in small, compound, and larger musical forms with emphasis on both stylistic and individual creative writing.
- 437-438-439. **Orchestration I-II-III (3-3-3). Pr., MU 233.**
Ranges, notation, and characteristics of orchestral instruments. Exercises in arranging for combinations of string and wind instruments. Theory and practice of orchestration for full orchestra.

141. **Piano Pedagogy (3).**
For prospective piano teachers. Study of teaching methods for beginners and succeeding levels. Classification and analysis of teaching repertoire.
142. **Vocal Pedagogy (3).**
For prospective voice teachers. An intensive study of the materials and methods of voice training. Classification and analysis of teaching repertoire.
143. **String Pedagogy (3).**
Mechanics of stringed instruments. Teaching methods, schools, and systems. Teaching literature and repertoire. For either violin, viola, cello, string bass or harp.
144. **Instrumental Pedagogy (3).**
Mechanics of brass or woodwind instruments. Teaching methods and repertoire with emphasis on solo instrumental literature.
145. **Theory Pedagogy (3).**
Required of seniors majoring in theory and composition. Designed to present the problems of sight-singing, rhythmic dictation, melodic and harmonic dictation, and part writing from a pedagogical viewpoint.
451. **Keyboard Literature (3). Pr., junior standing.**
Masterworks of the clavichord, harpsichord, organ, and piano literature from the Baroque period to the present.
452. **Vocal Literature (3). Pr., junior standing.**
Vocal literature from Elizabethan time to the present, including representative European and American repertoire.
453. **Choral Literature (3). Pr., junior standing.**
Chronological study of choral music from the Middle Ages to the present including opera, and oratorio with detailed examination of representative works.
454. **Instrumental Literature (3).**
Analysis and study of orchestral scores and parts from the classic, romantic and modern literature.
455. **Opera Literature (3).**
Vocal music of the opera from the Baroque to the present time.

General Elective Courses

201. **Fundamentals of Music (3).**
Music designed primarily to develop functional piano skills, sight-reading, rhythm and melodic skills.
372. **History of Jazz (3).**
The growth of Jazz from its African and European roots to current experimentation.
373. **Appreciation of Music (3). May not be taken for credit by Music Majors or Minors.**
Outstanding composers and compositions. No previous music training required; an orientation in the art of listening.
374. **Masterpieces of Music (3). May not be taken for credit by Music Majors or Minors.**
Representative musical works of each great period of musical history. No previous music training required.
- 477-478-479. **Music Arranging (3-3-3). By permission.**
Project course in arranging various combinations from quartet to symphonic band, and arranging for solo and choral groups.

Group Performance Courses

- 121-122-123. **Glee Club (1 hour credit per quarter).**
MEN'S GLEE CLUB AND WOMEN'S GLEE CLUB are study and performing groups open to any Auburn student. (May be taken with or without credit.)
- 124-125-126. **Concert Band (1 hour credit per quarter).**
Members of the Band are selected during the first week of each quarter. A minimum of 5 rehearsal hours per week is required, with extra rehearsals scheduled as necessary. Band members are required to be present at all rehearsals and all public performances. Students enrolled in Concert Band will have the drill portion of Basic Military Training waived. (May be taken with or without credit.)
- 127-128-129. **Orchestra (1 hour credit per quarter).**
Members of the symphonic orchestra are selected by try-outs during the first week of each quarter. (May be taken with or without credit.)
130. **Jazz Laboratory Band (1).**
A musical ensemble for advanced musicians for the study and performance of music relating to the jazz idiom. By audition only.
- 221-222-223. **Choral Union (1 hour credit per quarter).**
Open to any Auburn student by permission of choral director. (May be taken with or without credit.)

224. Marching Band (1 hour credit per quarter). (Fall Quarter only.)

Provides music for athletic contests and half-time shows at football games, various parades, pep rallies, and other campus and off-campus events. During the fall quarter, will rehearse a minimum of 7 hours per week. Physical Education may be waived for members of the Marching Band.* In addition, students will have the drill portion of basic military waived when enrolled in Marching Band. See Band Director for details. (May be taken with or without credit.)

227-228-229. Opera Workshop (1 hour credit per quarter).

Open to all students interested in opera, including performance, stage-craft, make-up, conducting, and coaching. A minimum of three hours per week rehearsal or stage-craft is required with extra time scheduled as necessary. (May be taken with or without credit.)

321-322-323. Concert Choir (1 hour credit per quarter).

CONCERT CHOIR is a small mixed chorus for study and performance of serious choral literature; open to any Auburn student by audition only. (May be taken with or without credit.)

324-325-326. Music Ensemble (1 hour credit per quarter). (By permission.)

Primarily for advanced musicians for the study and performance of musical compositions for small instrumental and vocal groups. A minimum rehearsal of three hours per week required. (May be taken with or without credit.) Includes brass, woodwind, percussion, piano & harp ensembles.

327-328-329. Piano Ensemble (1-1-1). Lab. 3-3-3.

Study through performance of original compositions and transcriptions for piano-four-hands and two pianos using two to four players.

Applied Music

Individual instruction is available in voice, piano, organ, strings, woodwinds, harp, brass and percussion.

Students desiring study in applied music must be approved by the Head of the Department of Music before entrance into the course.

080. Applied Music (0). May be repeated.

Individual instruction in instrumental or vocal areas. Rudimentary practice as related to each discipline.

181-82-83. Applied Music (3-3-3).**281-2-3. Applied Music (3-3-3).****381-2-3. Applied Music (3-3-3).****481-2-3. Applied Music (3-3-3).**

Individual instruction in instrumental or vocal areas. For Bachelor of Music majors only.

184-85-86. Applied Music (1-1-1).**284-85-86. Applied Music (1-1-1).****384-85-86. Applied Music (1-1-1).****484-85-86. Applied Music (1-1-1).**

Individual instruction in instrumental or vocal areas. For music majors in Bachelor of Arts program only.

187-88-89. Applied Music (1-1-1).**287-88-89. Applied Music (1-1-1).****387-88-89. Applied Music (1-1-1).****487-88-89. Applied Music (1-1-1).**

Individual instruction in instrumental or vocal areas. For students in Elementary and Secondary Education, all music minors, and applied music electives.

The amount of credit in Applied Music is based on the following practice schedule:

1 cr. hr.—5 hours weekly practice

3 cr. hrs.—15 hours weekly practice.

Applied Music Fees (Per Quarter)

One half-hour lesson per week	\$20.00
Two half-hour lessons per week	30.00
Use of practice room, one hour per day	3.00
Use of practice room, two hours per day	5.00

*In addition to the Physical Education stipulation, students will have the drill portion of Basic Military Training waived for the quarter they are enrolled in Marching Band.

Class Instruction in Applied Music

The Music Department offers a number of classes in Applied Music open to Music Majors and Minors and to regularly registered college students who have had previous music training. These classes meet two hours per week and carry one hour credit. Tuition fee \$5.00.

104-5-6. Piano Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to piano playing. (See above for fee.)

107-8-9. Voice Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to voice. (See above for fee.)

110-11-12. String Instruments Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to violin, viola, cello and contrabass playing. (See above for fee.)

113-14-15. Brass Instruments Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to playing on trumpet, trombone and other brass instruments. (See above for fee.)

116-17-18. Woodwind Instruments Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to playing on clarinet, oboe, bassoon, flute and other woodwind instruments. (See above for fee.)

119. Percussion Instruments Class (1). (2 Labs.)

Class instruction and practice in the rudiments of music as applied to playing percussion instruments: drums, bells, cymbals, triangle, tympani, etc. (See above for fee.)

GRADUATE COURSES

422-23-24. Theory Review (3-3-3). Pr., senior standing and departmental approval.

No credit for Applied, Theory-Composition, or Pedagogy majors. A review of the harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.

600-1-2. Advanced Instrumental and Choral Conducting (2-2-2).

Laboratory for development of skills relating to the performance of traditional and modern works. Emphasis on score reading and analysis.

603. Brass Instruments Techniques (1). Lec. 1, Lab. 3.

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on brass instruments.

604. Woodwind Instruments Techniques (1). Lec. 1, Lab. 3.

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on woodwind instruments.

605. Percussion Instruments Techniques (1). Lec. 1, Lab. 3.

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on percussion instruments.

606. Music in the Arts (4).

Music in relation to architecture, the plastic arts, and poetry.

607. Choral Literature of the Classic, Romantic and Modern Periods (4).

The styles, forms, and performance practices of the choral music from the Classic, Romantic and Modern periods, working primarily with scores of representative works. Participation in an approved choral organization is required.

608. Choral Arranging (4). Pr., departmental approval.

Advanced Arranging for various choral combinations. Participation in an approved choral organization is required.

609. Seminar in 20th Century Music (3-3-3). Pr., departmental approval.

Analysis and comparison of representative works of principal composers of the first half of the 20th century. Specific works chosen for each quarter. (May be repeated for a maximum of 9 hrs. credit.)

610. Band Arranging (4). Pr., departmental approval.

Advanced arranging for various band organizations. Participation in band is required.

611. Orchestral Arranging (4). Pr., departmental approval.

Advanced arranging for various orchestral organizations. Participation in orchestra is required.

612. Acoustics in Music (3). Pr., departmental approval.

The physics of sound as related to music.

634. Music History Seminar (2). Pr., departmental approval.

Different aspects of the history of music. Specific research areas chosen each quarter. (May be repeated for a maximum of 6 hrs. credit.)

644. Repertoire Seminar (2-2-2). Pr., departmental approval.

A comprehensive survey of music literature in the student's major area through analysis & performance. (May be repeated for a maximum of 6 hrs. credit.)

- 650-651-652. **Techniques of Private Instrumental Instruction (3-3-3).** Pr., departmental approval.
Analysis of teaching and supervised teaching.
- 653-654-655. **Techniques of Private Instruction in Voice 3-3-3.**
- 660-661-662. **Independent Study in Applied Music (3-3-3).** Pr., departmental approval.
Advanced private study and recital.
- 681-682-683. **Independent Study in (A) Composition, (B) Analysis (2-3, 2-3, 2-3).** Pr., departmental approval.
697. **Qualifying Recital.**

Naval Science (NS)

111. **Orientation to the Navy and Marine Sciences (3).** Lec. 3, Lab. 2. Fall.
Introduction to basic areas of Naval Science including such subjects as: naval officers' careers, uniforms and insignia, military courtesy, discipline, components and supporting elements of the Navy, logistics, communications, security, Naval Intelligence, naval and oceanographic research.
112. **Naval Ships Systems (3).** Lec. 3, Lab. 2. Winter.
Fundamentals of ship construction and stability, impaired stability, and damage control. Ship propulsion systems including steam, diesel, and nuclear. Basic thermodynamics and shipboard auxiliary systems.
113. **Highlights of Naval and Military History (3).** Lec. 3, Lab. 2. Spring.
A review of the impact of sea power upon history with emphasis on personality traits of naval figures that led to success or failure. Attempts to give the student some perspective on the evolution of naval warfare.
- 211-212-213. **Seminar: Seapower and Maritime Affairs (1-1-1).** Lec. 1, Lab. 2. Fall, Winter, Spring. Pr., NS 113 or as determined by the Professor of Naval Science.
Comparison of the growth and development of the Soviet and U.S. Merchant Marines; significance of economic, political, and military considerations; and effect on U.S. Sea Power strategy and foreign policies.
311. **Navigation I (3).** Lec. 3, Lab. 2. Fall.
A comprehensive study of the theory and principles of piloting involving the use of visual aids to fix a ship's position, and a study of the Rules of the Road for prevention of collision at sea.
312. **Navigation II (3).** Lec. 3, Lab. 2. Winter. Pr., NS 311.
A comprehensive study of the theory, principles, and procedures of celestial navigation.
313. **Naval Operations (3).** Lec. 3, Lab. 2. Spring.
Navy tactical formations and dispositions, relative motion, maneuvering board, communications, and tactical plots are analyzed.
- 321-322-323. **Evolution of the Art of War (2-2-2).** Lec. 2, Lab. 2. Fall, Winter, Spring.
An examination of the forms of warfare practiced in history in order to identify historical continuity and change in the evolution of warfare, demonstrate concepts of strategy by historical example, examine great captains and military organizations of history to discover the ingredients of their success and explore the impact of historical precedent and technological change on politico-military thought and action.
411. **Naval Weapons Systems (3).** Lec. 3, Lab. 2.
Basic interior and exterior ballistics; missile flight paths; spin/fin stabilization; gun, missile, and underwater battery systems; naval gunfire support.
412. **Principles of Naval Organization and Management I (3).** Lec. 3, Lab. 2. Winter. Pr., NS 313, MH 162 or MH 267, IE 204 or equivalent, PO 431, 6 or more hours of physical science (PS, CH, BI, GL, or ZY).
An historical approach to organization and management in the Department of Defense. Examination of various "schools of thought" in management and the principles associated with each. Review of the quantitative techniques used in management decision-making including network analysis, linear programming, economic analysis, time and motion study, and similar topics.
413. **Principles of Naval Organization and Management II (3).** Lec. 3, Lab. 2. Spring.
Principles of Naval Organization on various levels; Uniform Code of Military Justice; naval personnel administration; group dynamics; special problems in naval leadership.
421. **Amphibious Warfare (2).** Lec. 2, Lab. 2. Fall.
Amphibious warfare prior to World War II; definition of concept, examination of doctrinal origins, and the evolution of amphibious warfare as an element of naval policy.
422. **Amphibious Warfare (2).** Lec. 2, Lab. 2. Winter.
Continuation of NS 421. Amphibious warfare in World War II and the Korean Conflict, and evaluation of tactics and techniques.
423. **Amphibious Warfare (2).** Lec. 2, Lab. 2. Spring.
Current doctrine and techniques of amphibious warfare. Structure of Fleet Marine Force and current and projected equipment.

Nutrition and Foods (NF)

Professors Van de Mark, *Head*, Davis, and Fick
Associate Professor Chastain
Assistant Professors Driskell, Rush, and Whittle
Instructor Strawn

104. **Principles of Food Preparation (5).** Lec. 3, Lab. 4. Each quarter.
Basic principles underlying the fundamental processes and standards of food preparation.
112. **Nutrition and Man (3).** Each quarter.
The fundamentals of nutrition and the influence of socio-economic and cultural patterns of man on fulfilling nutritional needs.
204. **Meal Management (5).** Lec. 4, Lab. 3. Each quarter. Pr., NF 104.
Planning of meals with emphasis on scientific principles of nutrition, aesthetic value, management of time and the food budget on various economic levels.
318. **Nutritional Biochemistry (5).** Lec. 4, Lab. 3. Spring. Pr., CH 203.
Chemistry of carbohydrates, fats, proteins, vitamins, and minerals applied to human nutrition.
324. **Food Preservation (3).** Lec. 2, Lab. 3. Fall.
Principles and methods of food preservation.
356. **Institution Organization and Personnel Management (5).** Fall.
Quality food service operation as related to management principles, methods of control, and personnel management.
358. **Community and Family Health (3).** Lec. 2, Lab. 2. Winter, Summer.
Facilities, services and agencies within the community which affect health. Field trips.
362. **Problems in Community Nutrition (3).** Fall, Spring. Pr., NF 112, NF 372.
Environmental factors that influence the nutritional level of people.
372. **Fundamentals of Nutrition (3).** Lec. 3. Fall, Spring.
Principles of human nutrition and factors influencing food requirements.
382. **Nutrition and Dietetics I (5).** Lec. 3, Lab. 4. Fall. Pr., NF 318.
Preliminary identification, function, and sources of nutrients required by man.
392. **Nutrition and Dietetics II (5).** Lec. 3, Lab. 4. Winter. Pr., NF 318, NF 382.
Identification, function, metabolism and sources of specific nutrients required by man for normal growth, development, and maintenance. For nutrition majors.
402. **Diet Therapy (5).** Lec. 4, Lab. 2. Spring. Pr., junior standing, NF 392.
Application of principles of nutrition to various periods of stress and as a therapeutic aid in treatment of disease.
408. **Independent or Field Study.** 3 to 8 credit hours.
Laboratory or field experiences approved and supervised by a faculty member. May be repeated for a maximum of 8 credit hours.
416. **Quantity Food Production (5).** Lec. 3, Lab. 4. Spring. Pr., junior standing and NF 204.
Institution menu planning, preparation and sanitation in service of food. Use, operation, and maintenance of equipment. Laboratory experience in university food service operations.
426. **Food Purchasing and Financial Management (5).** Winter, junior standing.
Food marketing, purchasing, storage and inventory control.
436. **Food Service Systems (5).** Lec. 4, Lab. 2. Spring. Pr., junior standing and NF 356.
Application of the processes of planning, organizing, directing, evaluating and controlling of the functions and operations of food service systems.
446. **Catering (3).** Lec. 2, Lab. 3. Winter. Pr., NF 204.
Types of catered food-service functions; planning, pricing, organization, management, equipment and service.
452. **Family Nutrition (3).** Lec. 3. Pr., NF 372, NF 382 or equivalent.
Application of the principles of nutrition to family members of all ages.
464. **Experimental Foods (5).** Lec. 2, Lab. 6. Winter. Pr., NF 104 and CH 203.
Effects of variation of ingredients and treatments on quality characteristics of foods.
472. **Advanced Community Nutrition (3).** Pr., satisfactory course in nutrition and consent of instructor.
Nutrition problems and practices that exist in a modern society.
478. **Modern Views of Nutrition (3).** Pr., junior standing and satisfactory course in nutrition.
Current concepts in nutrition and related fields.
488. **International Nutrition (3).** Pr., junior standing and satisfactory course in nutrition.
Nutritional status of world population and local, national, and international programs for improvement.

492. **Infant and Child Nutrition (5). Pr., junior standing and NF 392.**
Nutrition requirements for growth from pre-natal life through adolescence.
601. **Seminar in Nutrition and Foods (1-5). Each quarter.**
May be taken more than one quarter for a maximum of 5 credit hours.
603. **Home Economics in Higher Education (5).**
The effects of scientific, technological and social developments on the family and the Home Economics profession as they have implications for higher education in this discipline. Emphasis: current trends in subject matter areas, scope and program development, administration, and instructional resources.
605. **Methods of Research in Home Economics (3).**
Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Nutrition and Foods.
609. **Special Problems in Nutrition and/or Foods. Credit to be arranged (2-5). Pr., consent of instructor. May be taken more than one quarter.**
620. **Experimental Foods (5). Pr., NF 464.**
Advanced study of experimental foods including chemical reactions involved in food combinations.
621. **Chemical and Physical Properties of Foods (5). Pr., NF 204 and NF 464.**
Chemical and physical changes of importance in food preparation and processing.
622. **Problems in Food Preservation (5). Pr., BY 220 or equivalent.**
Various problems which grow out of advanced study of preservation of foods. These problems are subjects for minor research.
623. **Readings in Nutrition and/or Foods (5-10). Pr., NF 382, CH 203.**
A critical survey of current literature. May be taken more than one quarter.
624. **Advanced Nutrition I (5). Pr., NF 392, CH 203, NF 318 or equivalents.**
Carbohydrates, fats and proteins.
625. **Advanced Nutrition II (5). Pr., NF 392, CH 203, NF 318 or equivalents.**
Vitamins, minerals and nutritional relationships.
626. **Advanced Nutrition III (5). Pr., NF 624 and 625, or equivalent.**
Assessment and application of nutritional status. Methods of appraisal of nutritional status, dietary, biochemical and clinical.
628. **Research Methods in Nutrition (5).**
A course designed to acquaint graduate students with modern laboratory techniques used in Human Nutrition Research.
699. **Research and Thesis. Credit to be arranged.**
Required of all students under the Thesis Option in any field.

Pharmacy (PY)

Professors Coker, Dean, Hargreaves, Hocking, and Williams
Associate Professors Darling, Kochhar, Rash, Thomasson, and Wilken
Assistant Professor Hamrick
Instructors Chien, Nasir and Yates
Research Lecturer in Toxicology Carl J. Rehling
Special Lecturers in Pharmacy Argo, Franklin, Godfrey, Lyman, and Peterson

Pharmacy

100. **Pharmacy Convocation (0). All quarters.**
Required of all pharmacy students each quarter. Professional topics discussed by visiting lecturers, faculty and students.
102. **Pharmaceutical Mathematics (3). Pr., MH 161.**
Mathematical calculations and concepts fundamental to the pharmaceutical sciences.
202. **Pharmaceutical Terminology (2). Pr., first professional year standing.**
Common terms and abbreviations used in the professional and scientific aspects of pharmacy and medicine.
205. **History of Pharmacy (3). Pr., first professional year standing.**
A general survey of the history of pharmacy designed to provide a knowledge of the heritage of the profession.
300. **Professional Accessories (3). Pr., second professional year standing.**
The use and capabilities of non-medical professional items such as clinical thermometers, rubber goods, and accessories, atomizers, surgical dressings, surgical supports, trusses.

- 301. Pharmaceutical Technology I (5). Lec. 3, Lab. 6. Pr., CH 208, PY 102, second professional year standing.**
Physical-chemical principles applied to develop thorough understanding of solid pharmaceutical dosage forms from bulk powders to more sophisticated sustained-release medications.
- 303. Pharmaceutical Technology II (5). Lec. 3, Lab. 6. Pr., PY 301, CH 204, CH 302.**
Continuation of PY 301 in which physical and chemical principles concerning homogeneous liquid dosage forms are studied. Selected official solutions, syrups, elixirs, spirits, etc., are considered from this viewpoint.
- 304. Pharmaceutical Technology III (5). Lec. 3, Lab. 6. Pr., PY 303.**
Continuation of PY 303 dealing with heterogeneous and plastic systems. Physical and chemical principles utilized in the study of the plastic and polyphasic dosage forms including ointments, creams, suspensions, colloids, mixtures, magmas, etc.
- 308. Hospital Pharmacy (3). Pr., second professional year standing.**
The development of hospitals, their place in society, importance and place of pharmacy in hospitals, administrative and policy making aspects together with interdepartmental relationships. Field trips to representative hospital pharmacies.
- 308L. Hospital Pharmacy Laboratory (1). Lab. 3. Pr., PY 304 and consent of instructor. Course may be repeated for a maximum of three credit hours.**
Hospital pharmacy experience is obtained in the environment of participating hospitals. Students are expected to furnish transportation for this elective course.
- 309. Introduction to Biopharmaceutics (3). Pr., PY 301.**
The relationship between the physicochemical properties of a drug in a dosage form and the therapeutic response observed after its administration.
- 400. Professional Practice I (5). Lec. 3, Lab. 6. Pr., PY 304.**
Principles and techniques applied in the formulation of extemporaneous compounded prescribed medications. Didactic topics include also therapeutic discussion relating to pre-fabricated dosage forms.
- 401. Professional Practice II (5). Lec. 3, Lab. 6. Pr., PY 400.**
A continuation of PY 400 emphasizing therapeutic and pharmaceutical problems countered in professional practice with primary consideration given to the development of a methodology for recognizing, preventing and correcting prescription incompatibilities.
- 402. Professional Practice III (5). Lec. 3, Lab. 6. Coreq., PY 401.**
Designed to acquaint the student with the pharmacist's responsibility in community health with special emphasis given to prescription accessories and non-prescription drugs.
- 410. Advanced Pharmacy (5). Lec. 3, Lab. 6. Pr., PY 400 and second professional year standing.**
The applications of modern pharmaceutical aids, such as surface active agents, the solubilizing agents and the complexing agents in compounding.
- 411. Elements of Pharmaceutical Manufacturing (5). Lec. 2, Lab. 9. Pr., PY 304, consent of instructor, and third professional year standing.**
Manufacturing procedures, operation, and principles. In the laboratory selected pilot scale production problems are carried out to completion including control and testing of finished products.
- 412. Public and Professional Relations (3). Pr., second professional year standing.**
Principles of public and professional relations with emphasis on establishing objectives and selecting appropriate communication media for creating favorable relationships with the public and the health care professions.
- 413. Special Problems (1-5; Maximum of 8). Pr., second professional year standing and consent of instructor; may be repeated for a maximum of 8 credit hours.**
- 414. Pharmaceutical Specialties (3). Pr., third professional year standing.**
More important non-official specialties available to modern prescription practice and over-the-counter sales are studied.
- 417. Introduction to Drug Therapy in Clinical Practice (5). Lec. 3, Recitation 2, Seminar 1. Pr., consent of instructor.**
Interdisciplinary approach to the systemic study of disease. Drug therapy presentations are related specifically to pathophysiology discussions of organ systems selected by the medical staff of Lee County Hospital.
- 418. Drug Therapy in Clinical Practice (5). Lec. 3, Clinical Conference 1, Lab. 6. Pr., PY 417.**
A clinical clerkship involving the observation of drug effects in patients. Students monitor and evaluate drug action by participating in patient rounds and clinical conferences.

COURSES FOR GRADUATE STUDENTS

- 601. Parenteral Preparations (5). Lec. 3, Lab. 6. Pr., PY 304 and consent of instructor.**
Theory, preparation and testing of various medicinal preparations intended for injection into the body. Pharmaceutical principles are applied to problems of filtration, sterilization, isotonicity, hydrogen ion concentration and aseptic techniques.
- 602. Tablet Manufacture (5). Lec. 2, Lab. 9. Pr., PY 304.**
Essentials in the manufacture, coating and evaluation of compressed tablets.

603. **Product Development (5).** Lec. 3, Lab. 6. Pr., PY 304.
Formulation, evaluation and control techniques as well as actual manufacture of products of pharmaceutical and cosmetic nature.
608. **Advanced Biopharmaceutics (5).** Lec. 3, Lab. 6. Pr., consent of instructor.
The relationship between physical and chemical properties of a drug and its dosage forms and the biological effects elicited following administration together with the relevant pharmacokinetics.
609. **Institutional Pharmacy (5).** Lec. 4, Lab. 3. Pr., PY 401 and consent of instructor.
Comprehensive presentation of pharmacy in hospitals, nursing homes, etc., from the viewpoint of the administrative pharmacist. The responsibilities of the director of pharmacy service in a hospital. Field trips taken and a term project on a current aspect of Institutional Pharmacy is required.
680. **Graduate Seminar (1).** Pr., admission to Graduate School.
Required of all pharmacy graduate students each quarter.
695. **Special Problems (2-5 hours).** Pr., consent of instructor.
May repeat for a maximum of 8 hours.

Pharmaceutical Chemistry

201. **Inorganic Pharmaceutical Chemistry (5).** Pr., CH 105, CH 204.
Inorganic chemicals; their manufacture, chemical properties, pharmaceutical and therapeutic uses, doses and preparations. Tests for identity and purity, together with assay methods are considered.
203. **Organic Pharmaceutical Chemistry (5).** Pr., PY 201, CH 208.
Organic chemicals; their manufacture, chemical properties, trade names, pharmaceutical and therapeutic uses, doses and preparations.
302. **Organic Pharmaceutical Chemistry (5).** Pr., PY 203.
Continuation of PY 203.
305. **Modern Methods of Drug Analysis (3).** Lec. 2, Lab. 3. Pr., CH 208.
Theory and application of physical and chemical methods with special emphasis on the use of chromatography, instrumentation, and non-aqueous systems in the analysis of pharmaceutical products.
404. **Chemistry of Natural Products (5).** Pr., CH 302 and second professional year standing.
Chemistry and nomenclature of fatty oils, volatile oils, steroids, glycosides, alkaloids, antibiotics, vitamins, and other natural products.
421. **Advanced Inorganic Pharmaceutical Chemistry (5).** Pr., PY 201 and second professional year standing.
Modern structural concepts of atomic and molecular theory, and reaction mechanisms of inorganic chemicals of medicinal importance.

COURSES FOR GRADUATE STUDENTS

- 620-621-622. **Chemistry of Synthetic Drugs (5-5-5).** Pr., PY 302 or consent of instructor.
Historical background, pertinent literature, organic name reactions, nomenclature, relation of chemical structure and physical properties to biological activity, isosterism, metabolite antagonism, enzyme inhibition, an exhaustive consideration of the chemistry and biological activity of the various therapeutic classes.
- 623-624-625. **Synthesis of Drugs (5-5-5).** Lec. 2, Lab. 9. Coreq., PY 620-21-22 or consent of instructor.
The principles and techniques of analysis as applied to the various therapeutic classes.
- 626-627. **Analytical and Control Methods (5-5).** Lec. 3, Lab. 6. Pr., PY 305 or consent of instructor.
The principles and techniques of analysis as applied to the various therapeutic classes.
628. **Steroid Chemistry (5).** Pr., PY 620 or consent of instructor.
Structure, determination, chemistry, synthesis and structure relationships of steroids of pharmacological and pharmaceutical importance.
629. **Alkaloid Chemistry (5).** Pr., PY 620 or consent of instructor.
Structure determination, chemistry and synthesis of alkaloids with emphasis on the alkaloids of pharmacological and pharmaceutical importance.
660. **Heterocyclic Medicinal Chemistry (5).** Pr., consent of instructor.
The chemical nature and behavior of heterocyclic moieties which are either themselves of medicinal significance or are components possessing therapeutic properties.

Pharmacology-Toxicology

403. **Toxicology (5).** Pr., ZY 424, CH 208 and second professional year standing.
Fundamentals of the isolation, identification, symptoms and treatment of the more common poisons.

405. **Pharmacology I (5).** Lec. 4, Lab. 3. Pr., ZY 424, CH 302 and second professional year standing.
Absorption and fate, mechanism of action, pharmaco-chemical relationships and toxicology of the official and more important non-official drugs, with a brief coverage of pathological conditions which indicate specific uses in therapy.
406. **Pharmacology II (5).** Lec. 4, Lab. 3. Pr., ZY 424, CH 302 and second professional year standing.
Continuation of PY 405. Pharmacology of vitamins, hormones, biologicals and antibiotics with major emphasis on endocrine products and deficiency states as related to specific therapy.
407. **Chemotherapeutic Drugs (5).** Pr., CH 302, VM 204 and second professional year standing.
Structure-action relationship of drugs and their use in inhibiting or destroying micro-organisms.
428. **Public Health (5).** Pr., BY 300, BY 302 or BY 220 and second professional year standing.
Epidemiological study of diseases of man. A survey of the public health and preventive medicinal programs of federal, state, local and private agencies is included.
429. **Biochemical Pharmacology (3).** Lec. 1, Lab. 6. Pr., CH 302 and second professional year standing.
Application of biochemical principles and techniques in the study of mechanisms of drug action.
430. **Pharmacological Techniques (5).** Lec. 4, Lab. 3. Pr., ZY 424 and second professional year standing.
Principles and techniques of procedures used in drug evaluation in animal subjects.
431. **Cellular Pharmacology (5).** Lec. 4, Lab. 3. Pr., PY 405-6, second professional year standing.
Cytological basis of pharmacodynamics including metabolic energy transformation, protein synthesis, and cellular control systems as related to drug actions.
432. **Fundamentals of Bionucleonics (3).** Lec. 2, Lab. 3. Pr., PS 206 or consent of instructor and second professional year standing.
Theoretical and practical application of trace level radioactivity for research application to pharmacy and allied sciences.

COURSES FOR GRADUATE STUDENTS

630. **Toxicological Methods (3).** Lec. 1, Lab. 6. Pr., PY 403 or equivalent.
Techniques applied to the separation and chemical identification of the more common volatile, non-volatile organic and metallic poisons.
- 631-632. **Psychopharmacology (5-5).** Lec. 4, Lab. 3. - Lec. 3, Lab. 6. Pr., PY 431 for PY 631 and PG 320 or PG 445 for PY 632.
Effect of neurotropic and psychotropic agents upon reverberatory circuits, chemical transmitters, neural amines, and metabolic energy systems; measures of rate of behavioral change; critique of behavioral screening techniques.
633. **Bioassay (5).** Lec. 4, Lab. 3. Pr., PY 430, MH 127 or an equivalent course in statistics.
Statistical basis for design of experiments and analysis of data in pharmacological quantitation.
637. **Pharmacology Seminar (3).** Pr., PY 430.
638. **Toxicology Seminar (1-3).** Pr., graduate standing.
Students are expected to present reviews of current literature and case histories. This will be followed with discussion by students and faculty.
- 650-651. **Advanced Toxicology (5-5).** Lec. 3, Lab. 6. Pr., PY 630 or equivalent.
The mechanism of action of poisons and antidotes, lethal doses and methods of detection and quantitation of poisons in tissues and body fluids. Practical application of analytic procedures and estimation of poisons in post-mortem and clinical specimens. The student will participate in a minimum of four post-mortem examinations with instructions in proper technique to obtaining specimens for toxicological analyses.
652. **Forensic Toxicology (3).** Pr., consent of instructor.
This course embraces a summary of medical jurisprudence including the laws governing the practice of forensic toxicology in criminal and civil prosecution. Collection, preservation and chain of evidence, and testimony in courts are stressed.

Pharmacognosy

306. **Pharmacognosy I (5).** Lec. 4, Lab. 3. Pr., BI 102, BI 103 and CH 207.
Plant and animal drugs studied from a basic biological standpoint, including classification (taxonomy), morphology, histology, microscopy, biogeography and related features.
307. **Pharmacognosy II (5).** Lec. 4, Lab. 3. Pr., CH 302, PY 306.
Biochemical presentation of drugs of natural origin including morphology, histology, mode of production, medicinally active constituents, assays and applications.

440. **Histology of Natural Products (3).** Lec. 2, Lab. 4. Pr., consent of instructor and second professional year standing.
Micro-chemical, micro-analytical, and micro-sectioning techniques, including methods of fixation, dehydration, embedding and staining tissues in the preparation of permanent mounts of microslides, with use of microtome and micro-dissection techniques.

COURSES PRIMARILY FOR GRADUATE STUDENTS

640. **Advanced Pharmacognosy (5).** Lec. 3, Lab. 6. Pr., PY 307 or equivalent.
Comprehensive study of both official and unofficial crude drugs conducted macroscopically and microscopically; techniques of use of camera lucida, microtome and microphotographic equipment; pharmacognosy of previously undescribed drugs.
641. **Advanced Microanalysis (5).** Lec. 3, Lab. 6. Pr., consent of instructor.
Methods of microscopy and microchemistry of natural materials and compounds.
642. **Histology of Medicinal Plants (5).** Lec. 3, Lab. 6. Pr., PY 440.
Microscopic structure of medicinal plants in fresh or preserved state as related to the origin and fate of plant compounds.
699. **Research and Thesis.** Credit to be arranged.

Pharmacy Administration

408. **Pharmacy Management (5).** Pr., EC 200, ACF 211, PY 416.
Elements of community pharmacy management, including location, layout organization, buying and stock control, advertisement, selling merchandising, financial analysis, competitive practice, and socio-economic factors of modern Pharmacy.
415. **Pharmaceutical Jurisprudence (3).** Pr., third professional year standing.
Legal aspects of pharmaceutical practice, giving primary consideration to State and Federal regulations bearing thereon.
416. **Drug Marketing (3).** Pr., EC 200, PY 101.
Basic principles of marketing drug products from the manufacturer to the consumer.

Philosophy (PA)

Professor Lapointe

Associate Professors Andelson and Davis

Assistant Professors Brown, McKown, *Acting Head*, and Walters

Instructors Cornett and Digby

202. **Ethics and Society (5).**
A brief outline of the scope and methodology of social ethics, followed by a critical survey of some ethical systems.
210. **Introduction to Philosophical Problems (3).**
An introduction to the methods of philosophical inquiry and an examination of selected philosophical topics.
211. **Introduction to Deductive Logic (3).**
The analysis and criticism of arguments, the formulation of principles of deduction and selected philosophical problems of logic.
212. **Introduction to Scientific Reasoning (3).**
Inductive techniques of hypothesis formation, and a discussion of such related problems in the theory of knowledge as perception, causation, and confirmation.
214. **Introduction to Ethics (3).**
An inquiry into and evaluation of types of ethical theory and schools of moral philosophy.
216. **Philosophies of Man (3).**
Fundamental conceptions of man emphasizing the recurring problems of human freedom, intelligence, immortality, and the relationship of man and woman in society.
220. **Eastern Religious Thought (3).**
Comparative study of Hinduism, Buddhism, Taoism, Confucianism, and Zen, with secondary emphasis on other Asian religions.
222. **Western Religious Thought (3).**
Comparative study of Judaism, Christianity, and Islam, with secondary emphasis on archaic Mediterranean religions.
330. **Philosophy of Religion (5).**
The philosophical investigation of such topics as the nature of religious language and religious knowledge, the existence of God, the human soul, and the problem of evil.
333. **Ancient Philosophy (5).**
From the Pre-Socratics through Plotinus, with emphasis on Plato and Aristotle.
370. **Symbolic Logic (5).**
Propositional logic through the logic of relations, and considerations of philosophical problems of formal logic.

380. **Pragmatism (5).**
Emphasis on Peirce, James, and Dewey. Some philosophical issues examined from a pragmatic viewpoint.
401. **Philosophical Foundations of Communism (5). Pr., junior standing.**
The origin, structure, and content of the thought of Marx-Engels and of their early disciples, Kautsky, Bernstein, and Lenin.
402. **Existentialism (5). Pr., junior standing.**
Selected works of such authors as Kierkegaard, Nietzsche, Sartre, Jaspers, and Heidegger.
404. **Modern Ethical Theories (5). Pr., junior standing.**
Recent analyses of the meanings, presuppositions, and problems of ethical terms and judgments.
405. **Aesthetics (5). Pr., junior standing.**
Major aesthetic theories from Plato to modern thinkers.
412. **Medieval Philosophy (5). Pr., junior standing.**
The medieval philosophical world of Christianity, Islam, and Judaism.
413. **Phenomenology (5). Pr., junior standing. Alternate years.**
The phenomenological method and its application in the works of William James, Husserl, Heidegger, Sartre, and Merleau-Ponty.
415. **Philosophy of the Natural Sciences (5). Pr., junior standing.**
An analysis of such topics as empirical meaning, verifiability, measurement, probability, causality, and determinism.
417. **Philosophy of the Social Sciences (5). Pr., junior standing.**
The basic philosophical theories and fundamental presuppositions of the social sciences.
432. **Process Philosophy (5). Pr., junior standing. Alternate years.**
An examination of selected writings of Bergson, Peirce, James, and Whitehead.
455. **Metaphysics (5). Pr., junior standing.**
A critical analysis of such topics as monism and pluralism, freedom and determinism, realism and nominalism, and the mind-body problem.
460. **Epistemology (5). Pr., junior standing.**
The origin, nature, kinds, and validity of knowledge, with a consideration of faith, intuition, belief, opinion, certainty, and probability.
470. **Plato (5). Pr., junior standing.**
Plato's epistemology, metaphysics, ethics, and political theory; his relationship to Socratic method and thought.
475. **Aristotle (5). Pr., junior standing.**
Aristotle's epistemology, metaphysics, ethics, and psychology; his relationship to his predecessors, and his role in Western thought.
480. **Analytic Philosophy (5). Pr., junior standing. Alternate years.**
The development of philosophical analysis in the twentieth century from G. E. Moore through the Oxford analysts.
482. **British Empiricism (5). Pr., junior standing.**
Seventeenth and eighteenth century development of empiricism with emphasis on Locke, Berkeley, and Hume.
484. **Continental Rationalism (5). Pr., junior standing.**
The works of Descartes, Spinoza, and Leibniz.
490. **Kant (5). Pr., junior standing.**
Kant's critical philosophy, with special emphasis on his epistemology, ethics, and metaphysics.
491. **German Idealism (5). Pr., junior standing.**
Post-Kantian German philosophy as manifested especially in the thought of Hegel, Schelling, Fichte, and Schopenhauer.
492. **Philosophy of Law (5). Pr., junior standing. Alternate years.**
The nature and function of law, including such topics as judicial reasoning, the ground of authority, natural law, legal responsibility, punishment, civil disobedience, and the relation of law to ethics and the behavioral sciences.
498. **Readings in Philosophy (1-10). Pr., junior standing, a 2.5 average in relevant prior work either in philosophy or in related areas and consent of department head and instructor. May be repeated for credit.**
Specific reading programs may be developed which pertain to a particular philosopher, period or problem. A paper and an examination will be expected.
650. **Seminar (1-10). Pr., consent of instructor. May be repeated for credit.**
The content will change for each quarter in any one calendar year. This will vary from movements of thought to an intensive study of one of the great thinkers such as Plato or Whitehead.

Physical Science (PHS)

Assistant Professor Ward

100. **Physical Science for Elementary Education I (5).** Lec. 4, Lab. 2. Open only to students in elementary education. Credit in PHS 100 and 101 precludes credit in PHS 151 and 152.
A historical approach to the development of modern science and the practices of modern technology intended to give the education student a broad acquaintance with and understanding of the ideas and methods of the physical sciences.
101. **Physical Science for Elementary Education II (5).** Lec. 4, Lab. 2.
Continuation of PHS 100.
151. **Introduction to Physical Science I (5).** Lec. 3, Rec. 2. Credit in PHS 151 and 152 precludes credit in PHS 100 and 101.
General physical science for non-science students. The nature of the physical world on both the microscopic and macroscopic scales, how things work, frames of reference, operational definitions, the "scientific method," energy and its transformations, and items of current interest such as radiation, space, and ecology.
152. **Introduction to Physical Science II (5).** Lec. 3, Rec. 2.
Continuation of PHS 151.
- *430. **Modern Concepts in Physical Science I (5).** Lec. 4, Lab. 3. Pr., junior standing, PHS 101 or PS 206, or consent of instructor.
Topics met in physical science, including: electronics, solid state physics, atomic theory, and quantum theory.
- *431. **Modern Concepts in Physical Science II (5).** Lec. 4, Lab. 3. Pr., junior standing, PHS 101 or PS 206, or consent of instructor.
Additional topics met in physical science, including: physical models, relativity, nuclear physics, and elementary particles.

Physics (PS)

Professors Carr, Head, Alford, Fromhold, and Latimer

Associate Professors Andrews, Askew, Budenstein, Clothiaux, French,
Kinzer, and MowatAssistant Professors Butler, Cooper, Harlan, Thaxton, and Ward
Instructor Forsythe

204. **Foundations of Physics (5).** Credit in PS 220 and 205 precludes credit for this course.
The basic principles of mechanics, heat, light, sound, electricity and magnetism and selected topics. For students in aeronautical administration, agricultural and industrial arts education, industrial design, and home economics.
205. **Introductory Physics—Mechanics, Heat and Sound (5).** Lec. 4, Lab. 3. Pr., MH 160.
The first half of a two-quarter course in the fundamentals of physics. The quantitative as well as the qualitative aspects of the subject are stressed. For students in architecture, forestry, laboratory technology, pharmacy, pre-dentistry, pre-medicine, pre-veterinary medicine, industrial management, textile science in home economics, and arts and sciences. The weekly three-hour laboratory periods are devoted to the performance of appropriate experiments.
206. **Introductory Physics—Electricity and Light (5).** Lec. 4, Lab. 3. Pr., PS 205.
Continuation of PS 205.
210. **Principles of Modern Physics (5).** Lec. 4, Lab. 3. Pr., PS 206.
The fundamental principles of physics to current topics. Lecture discussions are extended and supplemented by laboratory experience. Subjects include relativity, atomic and nuclear phenomena, and radiation.
217. **Astronomy (3).** General elective.
Descriptive astronomy, accompanied by occasional observations of the heavenly bodies with a three-inch refracting telescope.
220. **General Physics I (4).** Lec. 3, Lab. 3. Pr., MH 163 (or concurrently).
Mechanics and heat. PS 220-221-222 comprise a three-quarter sequence using calculus wherein a number of topics are discussed in depth. The sequence is intended to serve as a foundation for students in the mathematics, science, and engineering curricula.
221. **General Physics II (4).** Lec. 3, Lab. 3. Pr., PS 220; MH 264 (or concurrently).
Wave motion, sound, and optics.
222. **General Physics III (4).** Lec. 3, Lab. 3. Pr., PS 221.
Electricity and magnetism.

*Not available to graduate students in the areas of science or mathematics.

- 300-301. Intermediate Electricity and Magnetism I and II (4-4).** Lec. 3, Lab. 3. Pr., PS 222, PS 210, or PS 320; MH 401.
Development and application of Maxwell's equations. Topics include: AC circuits; electromagnetic measurements; laws of Gauss, Ampere, and Faraday; electric and magnetic properties of matter; and electromagnetic wave propagation.
- 302. Electronics (5).** Lec. 4, Lab. 3. Pr., PS 222, MH 264.
Review of AC and DC circuits; theory of vacuum tubes and semiconductors; diodes as rectifiers and regulators; tube and transistor voltage and power amplifiers; feedback amplifiers and oscillators; pulse and digital circuits. Appropriate laboratory exercises form a part of the course.
- 303. Optics (5).** Lec. 4, Lab. 3. Pr., PS 222, MH 401, junior standing or consent of instructor.
Intermediate course in physical optics comprising wave motion, reflection, refraction, dispersion, origin of spectra, interference, diffraction, and polarization, with appropriate laboratory experiments.
- 304. Applied Spectroscopy (5).** Lec. 4, Lab. 3. Pr., PS 222, MH 264.
The more important concepts of the origin of spectra; a study of instruments and techniques of practical spectroscopy. Laboratory experiments designed to give students in both chemistry and physics a working knowledge of spectroscopy as a tool.
- 305. Introduction to Modern Physics (5).** Lec. 4, Lab. 3. Pr., PS 222, MH 264.
Selected topics of modern physics, including atomic structure, wave-particle dualism, and and special relativity.
- 320. Modern Physics for Engineers (3).** Lec. 3. Pr., PS 222, MH 264.
Introduction to modern physics, including special relativity, Schrodinger wave mechanics, atomic and nuclear systems, elementary particles.
- 330. Fundamentals of Physics (10).** Demonstration lecture 3, lecture-recitation 7, laboratory 4, seminar 1. Pr., MH 160 (or concurrently). Offered Summer only by special arrangement.
Use of PSSC materials in which the fundamental principles of optics, mechanics, electricity and magnetism are stressed. For secondary school physics teachers with a limited background in physics who are enrolled in the Physics Summer Institute.
- 340. Intermediate Mechanics (3).** Pr., PS 221, MH 265.
Selected topics in mechanics including vector and coordinate kinematics and dynamics; free and driven damped harmonic oscillator; generalized coordinates and an introduction to LaGrange's equations.
- 401. Theoretical Physics I—Mechanics (5).** Lec. 4, Prob. 2. Pr., junior standing, PS 340 or ME 321, MH 265.
Newton's laws; systems of particles; conservation laws; free, damped, and forced oscillations; introduction to calculus of variations.
- 402. Theoretical Physics II—Mechanics Continued (5).** Lec. 4, Prob. 2. Pr., junior standing, PS 401.
Calculus of variations; Hamilton's principle and LaGrange's equations; vibrating systems; vector analysis; dynamics of rigid bodies.
- 403. Theoretical Physics III (5).** Lec. 4, Prob. 2. Pr., PS 301, PS 402, junior standing.
Introduction to electromagnetic theory using the mathematics of vector fields. The physical interpretation of the different fields is stressed.
- 404. Thermodynamics (5).** Pr., junior standing, PS 305, MH 362.
Equations of state. First and second laws of thermodynamics. The absolute temperature scale; the entropy, free energy, and Gibbs potential; general conditions of equilibrium. Application to reactions in gases and dilute solutions. Nernst's postulate.
- 405. Nuclear Physics (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 305, 320 or MH 265.
Nuclear radiations; transmutations; natural and artificial radioactivity; binding energy; nuclear forces; structure of the nucleus; nuclear fission and its applications. Appropriate laboratory experiments form a part of the course.
- 406. Advanced Laboratory I (2).** Lab. 6. Pr., PS 301 or 302, 305, junior standing.
Research oriented experiments will be selected in the areas of biophysics, plasmas, low temperature, high vacuum, wave propagation, nuclear and atomic spectroscopy, Mossbauer effect, nuclear magnetic resonance, transport in solids, Hall effect, mass spectrometry, advanced electronics, and other areas of current interest in research.
- 407. Advanced Laboratory II (2).** Lab. 6. Pr., PS 406.
A continuation of PS 406.
- 408. Advanced Laboratory III (2).** Lab. 6. Pr., PS 407.
A continuation of PS 407.
- 409. Introduction to Reactor Physics I (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 305 or PS 320, MH 362 or MH 406 or equivalent or consent of instructor.
Brief account of nuclear physics; basic instrumentation; interaction of neutrons with matter; chain reactions; neutron diffusion; the bare homogeneous thermal reactor; lattice constants; reactor kinetics.

410. **Introduction to Reactor Physics II (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 409.
Homogeneous reactor with reflector; reactor control; power reactors; thermal aspects of reactor systems; design variables; radiation detection and measurement; shielding; radiation hazards.
412. **Seminar in Modern Physics (1).** Pr., senior standing.
Library search, written reports, and oral presentation of a pertinent topic in modern physics.
413. **Introduction to X-ray Crystallography (5).** Lec. 4, Lab. 3. Pr., junior standing, PS 305, or consent of instructor.
Principles of crystallography, properties of X-rays, Laue and powder techniques, applications to crystal structure and grain size.
414. **Electron Optics and Microscopy (5).** Lec. 3, Lab. 6. Pr., junior standing and PS 222 and MH 264.
Electron optics; theory and operation of the electron microscope; techniques of mounting, replication and shadowing of specimen; electron diffraction, theory and interpretation of patterns.
- 415-416. **Intermediate Modern Physics I and II (5-5).** Pr., junior standing and MH 265, PS 305 or PS 320.
Special theory of relativity; introductory quantum mechanics with applications to microscopic systems; Fermi-Dirac, Bose-Einstein statistics; and electronic bands in solids.
417. **Introduction to Biophysics (5).** Pr., consent of instructor, junior standing.
The physics of biological systems, with emphasis on the cellular and subcellular levels; effects of light and high energy radiations, bio-electric phenomena, bio-energetics, etc.
419. **Scientific Instrumentation (3).** Lec. 2, Lab. 3. Pr., junior standing; PS 206; MH 162; and consent of instructor.
For advanced undergraduates and graduate students in the natural sciences. The course is directed to the selection and use of equipment normally used for lab experimentation in the scientific fields. Pertinent laboratory experiments will accompany the course.
421. **Modern Electronics (5).** Lec. 3, Lab. 6. Pr., PS 302 and junior standing.
Network theory and digital logic; state-of-the-art electronic devices; operational amplifiers; linear and digital integrated circuits; servo systems; selected topics in modern instrumentation.
425. **Principles of Nuclear Energy Systems (5).** Pr., PS 305 or PS 320, MH 265, or consent of instructor.
Fundamental aspects of nuclear energy systems including: nuclear properties of matter, the fission process, radiation, nuclear reactor and plant design, thermal aspects of nuclear reactors, reactor control, safety analysis, licensing, isotope power sources, space applications, and fusion.
435. **Introduction to Solid State Physics (5).** Pr., MH 406, PS 305 or PS 320 or PS 415; junior standing.
Solid state phenomena including lattice vibrations, band description of electronic states in metals, semiconductors and insulators, and magnetic phenomena.
470. **Health Physics (5).** Lec. 4, Lab. 3. Pr., consent of instructor, junior standing.
Fundamental principles of radioactivity; instrumentation for detecting and monitoring radioactive nuclides; radiation effects on man; permissible radiation dosages; safe handling of radioactive substances; and shielding from various radiations.

GRADUATE COURSES

601. **Advanced Dynamics I (3).** Pr., 402.
D'Alembert's principle; introduction to the calculus of variations; Hamilton's principle and Hamilton's equations; principle of least action.
602. **Advanced Dynamics II (3).** Pr., PS 601.
Canonical variables and contact transformations; the Hamilton-Jacobi equation; action; angle variables; Poisson brackets; continuous systems.
603. **Mechanics of Continuous Media (3).** Pr., PS 602.
Introduction to theories of elasticity and fluids.
- 604-605-606. **Theory of Electricity and Magnetism I-II-III (3-3-3).** Pr., PS 403 or EE 391; Coreq., MH 607-608-609.
Maxwell's formulation of classical electromagnetic theory. Includes electrostatics, magnetostatics, potential problems, electric currents, Maxwell's equations, electromagnetic waves, radiation theory, boundary value problems.
607. **Physical Optics (3).** Pr., PS 606.
Application of Maxwell's equations to optical phenomena including Kirchhoff's formulation, propagation of electromagnetic waves in anisotropic media, double refraction, dispersion.
611. **Plasma Physics I (3).** Pr., PS 301, PS 402, or consent of instructor.
Particle interactions and orbit theory, plasma kinetic theory, Boltzmann equation, transport phenomena, Fokker-Planck equation, plasma generation and diagnostics.
612. **Plasma Physics II (3).** Pr., PS 611 or consent of instructor.
Wave phenomena in plasmas, free and forced plasma oscillations, waves in anisotropic plasmas, shock waves, plasma stability, beam-plasma interactions.

613. **Plasma Physics III (3). Pr., PS 612 or consent of instructor.**
Radiation processes in plasmas without magnetic fields, bremsstrahlung of transverse waves, cyclotron radiation and echoes, scattering of transverse waves.
614. **Plasma Spectroscopy (3). Pr., PS 606, PS 642 or consent of instructor.**
Classical and quantum radiation theory, line oscillator strengths, line-broadening, equilibrium relations, temperature and density measurements.
628. **Statistical Mechanics I (3). Pr., PS 402, PS 404.**
Theory and applications of equilibrium statistical mechanics: relation of statistical mechanics to thermodynamics.
629. **Statistical Mechanics II (3). Pr., PS 628.**
Statistical mechanics of quantum mechanical systems. Introduction to non-equilibrium statistical mechanics. Boltzmann transport equation. Fluctuations and dissipation.
630. **Modern Physics for High School Teachers (5). Lec. 4, Lab. 3. Pr., PS 330 or equivalent, MH 487 or equivalent.**
Physics since 1890 including: structure of matter; atomic and molecular spectra; X-rays, natural and induced radioactivity; nuclear fission and fusion; and cosmic rays.
632. **Special Theory of Relativity (3). Pr., PS 602, PS 604.**
Relativistic mechanics, covariant formulation of Maxwell's field equations, LaGrangian and Hamiltonian formulation of fields.
635. **Solid State Physics I (3). Pr., PS 435, PS 643.**
Electrons in a perfect crystal lattice, description of the symmetry properties of solids, Brillouin zones.
636. **Solid State Physics II (3). Pr., PS 635.**
Cohesive energy, interaction of electrons with electromagnetic radiation interactions between electrons and the crystal lattice.
637. **Solid State Physics III (3). Pr., PS 636.**
Magnetic properties of solids; para-, dia-, ferro-, and antiferromagnetic effects. Resonance experiments, optical properties of solids.
639. **Directed Reading in Physics (2). Pr., consent of instructor. May be repeated for credit.**
641. **Quantum Mechanics I (3). Pr., PS 402.**
Action principle; Schrodinger's equation; operator formalism; bound state problems; angular momentum.
642. **Quantum Mechanics II (3). Pr., PS 641.**
Transformation theory; perturbation calculations; particle in electromagnetic field; radiative transitions.
643. **Quantum Mechanics III (3). Pr., PS 642.**
Scattering theory; S matrix; identical particles; applications.
- 644-645. **Advanced Quantum Mechanics I-II (3-3). Pr., PS 643 or consent of instructor.**
Dirac electron; field quantization; interactions; Feynmann diagrams; dispersion relations.
653. **Seminar in Physics (2). Pr., consent of instructor. May be repeated for credit.**
655. **Special Topics in Theoretical Physics (3). Pr., consent of instructor. May be repeated for credit.**
Choice of topic will vary but will include: relativity theory; group theory; atomic and molecular structure; elasticity; fluid mechanics; quantum field theory; low temperature physics.
661. **Nuclear Structure (3). Pr., PS 405, PS 643.**
Selected topics on properties of nuclei.
662. **Nuclear Processes (3). Pr., PS 661.**
Radioactive decay, nuclear reactions.
- 671-672. **Advanced Solid State Theory I and II (3-3). Pr., PS 637.**
Quantum field theory methods of solving the many-body problem, second quantization, statistical mechanics in occupation number formalism, Feynmann diagrams and infinite-order perturbation theory, Green's function propagators, "dressed" interactions and quasi-particles, many-body effects in metals, Fermi liquid theory, present-day theories of super-conductivity, ferromagnetism, and other cooperative phenomena.
691. **Directed Reading in Contemporary Physics. (Credit to be arranged.) Pr., completion of 30 hours of advanced courses in physics. May be repeated for credit.**
699. **Research and Thesis. (Credit to be arranged.)**
799. **Research and Dissertation. (Credit to be arranged.)**

Political Science (PO)

Professors Fortenberry, *Head*, Boyne, Hayhurst, and Hobbs
Associate Professors Dickson, Metzger, and Walkin
Assistant Professors Johnson, McNorton, Nelson, and Pickering
Instructors Gardner, Latimer, and Pendergast

209. **Introduction to American Government (5).**
Constitutional principles; federalism; elections and public opinion; legislative, executive, and judicial departments; principal functions.
210. **American State and Local Government (5).**
State constitutional principles; organization and functions of state government; national-state and state-local relations; special attention to Alabama government.
300. **Scope of Political Science (3). Pr., sophomore standing.**
Scope of and approaches to the study of political science and its specialties. Designed for political science majors.
309. **Introduction to International Relations (5). Pr., sophomore standing.**
International relations, including a consideration of the bases of national power and the rudiments of international politics.
311. **International Organization (5). Pr., sophomore standing.**
The evolution of international organization from the beginning through the United Nations.
312. **Introduction to Comparative Government and Politics (5). Pr., sophomore standing.**
Methods of classifying governments by institutional and developmental characteristics. A review of the forces which create political stability and instability, democracy and dictatorship; contemporary political systems in selected countries will be used for comparison.
314. **American Foreign Policy (5). Pr., sophomore standing.**
Analysis of the decision-making process of American foreign policy and of selected current issues of American foreign policy.
315. **American Political Thought (5). Pr., sophomore standing.**
The principal American political philosophers and philosophies and their influence on political institutions.
323. **Municipal Government in the United States (5). Pr., sophomore standing.**
Functions of city government, relation of city to state; electorate, party system and popular control; forms of government; administrative organizations; some reference to Alabama.
325. **Introduction to Public Administration (5). Pr., sophomore standing.**
Study of organization, development, procedures, process, and human factors involved in administration in a political environment.
327. **Policy and Administration (5). Pr., sophomore standing.**
Resources in the American economy; consideration of constitutional, political and geographic factors in the development of resources; policy; organization, procedures, and programs for administration and development of natural resources.
328. **Government and the Economy (3). Pr., sophomore standing.**
An examination of constitutional and political bases of governmental action; the origin and evolution of policies; relationships between political and economic institutions; and the consequences of governmental action or inaction.
329. **The Executive (3). Pr., sophomore standing.**
The American presidency and state governorships with a view toward analyzing the political dynamics of chief executives and their relationships to the competitive branches and units of government within the American political system.
331. **The Legislative Process (3). Pr., PO 209 or 210 and sophomore standing.**
The principles, procedures, and problems of lawmaking in the United States; special attention to Congress and the state legislatures.
332. **The Judicial Process (3). Pr., sophomore standing.**
The role of the courts; the nature of jurisprudence; comparative legal systems; the origin of law; and the concept of legality.
336. **Criminal Justice (3). Pr., sophomore standing.**
An in-depth examination of the various procedural due process rights of the Constitution as they relate to the criminal processes—historical development, modern interpretations, and further trends.
340. **Political Parties and Politics (5). Pr., PO 209 and sophomore standing.**
The nature, organization, and operation of political parties in the United States; the suffrage; nominating and electoral processes; importance and nature of interest groups.
344. **Research Methods in Political Science (3). Pr., sophomore standing.**
Survey of the basic techniques for political analysis. Emphasis on data, theory, techniques and methods of empirical research.
360. **Survey of Law Enforcement (5). Pr., sophomore standing. (Same as LE 360.)**
Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation.
401. **American Constitutional Law I (5). Pr., junior standing.**
The Constitution of the United States on the basis of the decisions and opinions of the Supreme Court defining judicial review, the relationship of the executive, legislative, and judicial branches of the national government, and the federal system.
402. **American Constitutional Law II (5). Pr., junior standing.**
The Constitution of the United States on the basis of the leading decisions and opinions of the Supreme Court defining civil rights in relation to both national and state governments.

405. **Metropolitan Area Governmental Problems (3). Pr., junior standing.**
Political, governmental, and administrative organization and actions in urban areas with many governmental entities; governmental problems resulting from urbanization and possible solutions.
415. **Public Personnel Administration (3). Pr., junior standing.**
Personnel policies and processes of national, state and local governments. The role of politics in public personnel management.
418. **Administrative Law (3). Pr., junior standing.**
General nature of administrative law; types of administrative action and enforcement; analysis of rule-making and adjudication; administrative due process; judicial review; Case method.
420. **Political Thought Before the Nineteenth Century (5). Pr., junior standing.**
The development of political thought from the Greeks to 1800; attention to the philosophers and the early theories that are found in modern political institutions.
421. **Political Behavior (5). Pr., junior standing.**
An analysis of the processes of political attitude formation. Special emphasis on the development and testing of empirical theories of political culture, political socialization process, public opinion formation and participation.
422. **Recent and Contemporary Political Theory (5). Pr., junior standing.**
The political theories of the nineteenth and twentieth centuries; analysis and comparison of modern ideologies.
423. **Communist Theory and Practice (3). Pr., junior standing.**
Marxist ideology as modified by Lenin, with illustrations of actual practice drawn from all sides of the communist world.
426. **Governments of Western Europe (5). Pr., junior standing.**
Descriptions and analyses of the principal political structures and power systems of Western Europe with particular emphasis upon Great Britain, France, and Germany.
428. **Government and Politics of the Near East (5). Pr., junior standing.**
The political environment, institutions, and processes of the Near East countries, radicalism and conservatism in the area, the Arab-Israeli conflict, and major power interests.
431. **National Security and Foreign Policy (4). Pr., junior standing.**
The role of force as an instrument of foreign policy, security considerations and their relationships to policy; the impact of technological innovation; collective security and arms control; internal issues affecting national security; primary emphasis on U. S. security concepts and strategies and problems to which they give rise.
433. **Government and Politics of the Far East (5). Pr., junior standing.**
The political environment, institutions, and processes of the Far East, with emphasis on China and Japan; also foreign relations of the area including Great Power interests.
435. **Contemporary International Politics (5). Pr., junior standing.**
A survey of the conflicts of national interests in contemporary international politics with special emphasis on the efforts to resolve these issues through diplomacy. This course will give students the opportunity to apply their academic training to an analysis of actual contemporary international issues.
436. **Government and Politics of the Soviet Union (5). Pr., junior standing.**
A study of the present status of the Soviet totalitarian system with attention to its origin, the essentials of the Stalinist pattern, the post-Stalinist political dynamics, and the nature and significance of contemporary changes.
437. **Soviet Foreign Policy (5). Pr., junior standing.**
The factors affecting Soviet foreign policy as seen in historical perspective, with emphasis on the post-war Stalinist practices and the modifications made by the post-Stalin leadership.
438. **Government and Politics of Eastern Europe (5). Pr., junior standing.**
A comparative study of the political institutions of the Eastern European Communist states, emphasizing especially those features which diverge the most from the totalitarian pattern of the Stalinist era. Attention will also be given to the foreign relations of the Eastern European powers, including those with the Soviet Union and Communist China.
439. **Government and Politics of Latin America (5). Pr., junior standing.**
The political environment, institutions, and processes of Latin America with emphasis on dynamic factors that influence the degree of democracy and authoritarianism, stability and instability, and politico-economic development in the area.
440. **International Law (5). Pr., junior standing.**
The origin and development of international law with special emphasis on recent and current developments—trends.
445. **The Government and Politics of the Developing Nations (5). Pr., junior standing.**
The problems involved in creating stable political systems in underdeveloped and recently colonial countries. Selected countries of this type will be used for comparison.
450. **Political Internship (2-5).**
Fellowship or other practical political experience in executive, legislative, or judicial offices of government, or related political activities arranged and approved by the department head.

GRADUATE COURSES

611. **Seminar in American Government (3-5).**
A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of American government.
613. **Seminar in State and Local Government (3-5).**
A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of state and local government. Some attention will be given to Alabama.
625. **Seminar in Political Parties, Pressure Groups and Political Issues in the United States (5).**
The interaction of political parties, pressure groups and the general public as a determinant in resolving political issues.
635. **Seminar in Public Administration (5).**
Various processes, functions, theories, practices and systems as treated in the literature of public administration.
645. **Seminar in Comparative Government (5).**
The major institutions, functions, and problems of representative political systems. Includes the methodology and bibliography of comparative government and politics.
655. **Seminar in International Relations (5).**
The basic literature of the field of International Relations with special emphasis on the critical evaluation of this material.
665. **Seminar in Political Theory (3-5).**
The problems of scope and methods of inquiry in the fields of political theory with intensive research in selected topics.
675. **Seminar in Constitutional Law (5).**
Selected areas of constitutional law with readings in depth in relevant cases and constitutional theory.
699. **Research and Thesis. (Credit to be arranged.)**

READING COURSES

The following directed reading and research courses are offered on a demand basis to enable graduate students to pursue specialized topics and are rigorously supervised by professors in each field. Registration is by permission of the department and the major professor.

617. **Reading Course in American Government (3-5).**
627. **Reading Course in Public Law (3-5).**
637. **Reading Course in Public Administration (3-5).**
647. **Reading Course in Comparative Government (3-5).**
657. **Reading Course in International Relations (3-5).**
667. **Reading Course in Political Theory (3-5).**

Poultry Science (PH)

Professors Moore, Head, Cottier, Edgar, and Mora
Associate Professors Goodman and McDaniel

301. **General Poultry Husbandry (5). Lec. 4, Lab. 2. Fall, Winter, Spring, Summer.**
Principles of poultry production and their application to general farm conditions, including breeding, feeding, housing, diseases, and culling.
302. **Poultry Meat Production (3). Lec. 2, Lab. 2. Fall. Pr., PH 301.**
Practical problems involved in raising broilers, capons, and turkeys for meat production.
404. **Poultry Management (5). Lec. 4, Lab. 2. Spring. Pr., PH 301 and junior standing.**
Poultry problems and management of commercial flocks.
405. **Poultry Feeding (3). Fall. Pr., PH 301 and junior standing.**
Composition and use of poultry feeds in connection with the demands for growth, body maintenance, and egg production.
406. **Incubation and Brooding (3). Lec. 2, Lab. 2. Winter. Pr., PH 301 and junior standing.**
Embryology of the chick, theory and practice of incubation and brooding.
- 407-409. **Poultry Problems (3-3). Lec. 1, Lab. 4. Pr., 12 hours PH courses and junior standing. All quarters.**
Investigation on some phase of poultry work.
408. **Poultry Diseases and Parasites (5). Lec. 4, Lab. 2. Winter. Pr., PH 301 and junior standing.**
Prevention, diagnosis, control, and treatment of the common diseases and parasites of poultry, designed especially for Agriculture students.

410. **Poultry Breeding (3).** Lec. 3. Spring. Pr., PH 301, ZY 300, and junior standing. Physiology of reproduction and inheritance of various poultry characters responsible for efficient egg and meat production and low mortality.
411. **Poultry Marketing (3).** Lec. 2, Lab. 2. Spring. Pr., PH 301 and junior standing. Grading eggs and poultry and study of problems of poultry marketing.
414. **Environmental Physiology and Bioengineering (5).** Lec. 3, Lab. 4. Winter. Pr., ZY 425 or AN 302 or equivalent; senior standing; and consent of instructors. Practices and theories of environmental engineering and science directly applicable to animal environments. Physiological responses of animals to various environmental parameters.
422. **Avian Diseases (5).** Lec. 4, Lab. 2. Fall.
Diagnosis, treatment, and prevention of infectious and parasitic diseases. Clinical and autopsy demonstrations are performed during laboratory periods. (For Veterinary students only.)

GRADUATE COURSES

423. **Biological Rhythms (5).** Lec. 5. Spring. Pr., junior standing and ZY 424 or approval of instructor.
Factors that affect the rhythmic pattern of organisms. Both exogenous and endogenous rhythms will be studied.
604. **Advanced Poultry Production (5).** Lec. 5. Spring.
Advanced studies on various phases of poultry production.
606. **Advanced Poultry Breeding (5).** Lec. 4, Lab. 2. Fall.
Advanced studies of the principles of heredity as applied to poultry breeding.
607. **Advanced Poultry Problems (2 to 5).** All quarters. (May be taken more than once to a maximum of 5 hrs.)
Assigned problems.
608. **Seminar.** Credit to be arranged. Fall, Spring, Winter, Summer.
Literature in Poultry Husbandry and other fields related to poultry. Emphasis will be given to the preparation, organization and presentation of research material by students and to reporting of current literature in the field. Designed for seniors in Poultry or Animal Husbandry as well as graduate students.
610. **Advanced Poultry Nutrition (5).** Lec. 5. Summer.
Advanced study of the nutrients, their function and the nutritional requirements of poultry.
611. **Advanced Poultry Management (5).** Lec. 5. Summer.
Advanced study of the principles of management of commercial poultry flocks.
612. **Advanced Poultry Diseases (5).** Lec. 1, Lab. 8. Spring. Pr., PH 408 or consent of instructor.
Isolation, cultivation, and identification of bacterial, fungal, and viral agents. Emphasis on biochemical aspects of microbial and nutritional diseases and the mechanisms of the immune response.
613. **Advanced Poultry Diseases (5).** Lec. 1, Lab. 8. Summer. Pr., VM 418 and PH 612, or equivalent.
Continuation of PH 612 with emphasis on those disease conditions caused by protozoa, helminths, and arthropods and the gross and histopathology of diseases studied in both quarters.
614. **Immunochemistry (5).** Lec. 3, Lab. 4. Fall. Pr., general bacteriology, immunology and organic or biochemistry.
Advanced study of the fundamental principles of immunology including specificity, antibody synthesis and the thermodynamics of antigen-antibody reactions. Laboratory will include the use of immunodiffusion, immunoelectrophoresis, fluorescent-antibody technique and quantitation of the precipitin reaction.
615. **Avian Physiology (5).** Lec. 2, Lab. 6. Winter. Pr., ZY 424 and organic chemistry.
General physiology of birds with particular reference to domesticated species.
618. **Experimental Virology (5).** Lec. 3, Lab. 4. Winter. Pr., VM 461, VM 495, CH 208, CH 420 or equivalent and permission of instructor.
Advanced study of fundamental properties of plant, animal and bacterial viruses including biochemical and biophysical properties and mechanisms of infection. Laboratory includes isolation, purification and fractionation of viruses; identification of anti-viral agents using in vitro systems.
699. **Research and Thesis.** (Credit to be arranged.) All quarters.
Technical laboratory problems related to poultry.
799. **Doctoral Research and Dissertation.** (Credit to be arranged.) All quarters.

Psychology (PG)

Professors Schaeffer, Head, Foshee, Lair, McIntyre, and Spears
Associate Professors Cahoon, Irvine, Moon*, and Vallery
Assistant Professors Dragoin and Hughes

*On leave 1971-72.

211. **Psychology (5).**
Human behavior emphasizing principles of learning, perception, and motivation.
212. **Psychology (3).**
The development of human behavior.
215. **Quantitative Methods (5).** Lec. 3, Lab. 4. Pr., MH 161, PG 211.
Introduction to the measurement of behavior and to quantitative methods of data analysis.
320. **Experimental Psychology I: Learning (4).** Lec. 3, Lab. 3. Pr., PG 212, 215 (PG 215 may be taken concurrently).
Experimental analysis of behavior modification emphasizing problems, concepts, and methods.
321. **Experimental Psychology II: Perception (4).** Lec. 3, Lab. 3. Pr., PG 212, 215 (PG 215 may be taken concurrently).
Discrimination, generalization, and their physical and physiological correlates.
322. **Experimental Psychology III: Personality (4).** Lec. 3, Lab. 3. Pr., PG 320.
Motivation, cognitive processes, and adaptive behavior.
330. **Social Psychology (4).** Lec. 3, Lab. 2. Pr., PG 212 or SY 203.
Analysis of social behavior including roles, group identification, attitudes, and conflicts among these.
350. **Behavior Modification in Early Childhood (5).** Lec. 3, Lab. 4. Pr., departmental approval.
Application of learning principles to the modification of behavior in the preschool child. Laboratory practice will supplement classroom discussion.
360. **Fields of Professional Psychology (5).**
Contributions of psychology to medicine, education, law, and human engineering in industry. Not open to students majoring in Psychology.
407. **Maturity and Aging (5).** Pr., PG 212, junior standing.
Development psychology relating to changes in and problems of human maturity from early adulthood to old age.
415. **Introduction to Theory of Measurement (5).** Lec. 5. Pr., junior standing and PG 322 or departmental approval.
Theories of measurement and psychological testing with examples of their applications.
416. **Psychological Testing (5).** Lec. 2, Lab. 6. Pr., junior standing, PG 415, or departmental approval.
Assessment of the individual by group tests and inventories.
430. **Perception (4).** Pr., junior standing and PG 321, PG 322 or departmental approval.
Theories of perception, emphasizing both general and individual factors that influence meaning.
431. **Social Psychology (5).** Pr., 15 hours of psychology and junior standing.
Theories of social behavior; processes of social influence; group structure and dynamics; influence of basic psychological processes on social behavior.
433. **Personality (4).** Pr., junior standing and PG 322 or departmental approval.
Objective, phenomenological, and psychoanalytic theories of personality.
435. **Behavior Pathology (4).** Pr., junior standing and PG 322 or departmental approval.
Types of abnormal behavior and their social and biological origins. Opportunities for field trips will be provided.
440. **Physiological Psychology (5).** Pr., junior standing and 20 hours of biological sciences, or departmental approval.
The physiological correlates of behavior, including sensory and response mechanisms, with special emphasis on central nervous system function.
445. **Animal Behavior (5).** Pr., junior standing and 20 hours of biological sciences, or departmental approval.
Analysis of unlearned and learned animal behavior and its evolutionary development, integrating the contributions of ethological and behavioristic research.
450. **Learning (4).** Pr., junior standing and PG 320 or departmental approval.
Theories of learning and their logical and empirical foundations.
461. **Industrial Psychology (5).** Pr., junior standing.
The uses of psychology in business and industry.
462. **Training and Supervision of Industrial Personnel (3).** Pr., junior standing.
Application of the principles of learning to the training of factory, office, and sales employees.
463. **Interviewing and Classifying Industrial Personnel (3).** Pr., junior standing.
Principles and practices in interviewing.

480. **History of Psychology (4).** Pr., junior standing and 20 hours of psychology or departmental approval.
Evolution of psychology from physics, physiology, and philosophy to a science of behavior.
490. **Special Problems in Psychology (1-8).** Pr., junior standing, departmental approval. May be repeated for a maximum of 8 credit hours but only one registration per quarter permitted.
An individual problems course. Each student will work under the direction of a staff member on some experimental or theoretical problem of mutual interest.

GRADUATE COURSES

- 600-601. **Behavior Theory I, II (5-5).** Pr., 20 hours of experimental and theoretical psychology and departmental approval; 600 for 601.
Survey of current theory in psychology and introduction to theory construction.
- 605-606. **Developmental Psychology I, II (5-5).** Pr., PG 433.
An examination and critical analysis of research on selected topics and theories in developmental psychology.
611. **Theory of Measurement (5).** Pr., PG 416, PG 625, and departmental approval.
Statistical theory of error and true values; scaling methods.
620. **Experimental Psychology I: Learning (5).** Lec. 3, Lab. 6. Pr., PG 215 and PG 320 or PG 450.
Analysis of learning stressing experimental methodologies illustrative of major theoretical approaches.
621. **Experimental Psychology II: Psychophysics (5).** Lec. 3, Lab. 6. Pr., 20 hours of experimental and theoretical psychology.
Physiology of receptor function and methodologies relating physical properties of stimulation to subject response variables.
622. **Experimental Psychology III: Personality-Social (5).** Lec. 3, Lab. 6. Pr., PG 601.
Experimental studies of complex processes in humans.
623. **Analysis of Behavior (5).** Lec. 2, Lab. 10. Pr., PG 620.
Methods and concepts of operant conditioning research with animals and humans stressing current research and literature.
625. **Experimental Design I (5).** Pr., PG 215 and PG 320.
Analysis of variance, expected mean squares, and correlation methods.
626. **Experimental Design II (5).** Pr., PG 625 and 620, 621, or 622.
Advanced topics in variance and multivariate analysis relating to research design.
631. **Social Psychology (5).** Pr., PG 431.
Major systems and theories relating to social psychology, including *Gestalt*, reinforcement, psychoanalytic, role and field theory.
635. **Theories of Personality (5).** Pr., PG 433 and 601.
Continuation of PG 433 emphasizing analysis of current issues.
637. **Behavior Pathology (5).** Pr., PG 435, 635, and consent of instructor.
Continuation of PG 435 emphasizing current theoretical conceptions and research in psychopathology.
638. **Systems of Psychotherapy (5).** Pr., PG 433 and PG 435.
A survey of theories and research related to modern systems of psychotherapy.
640. **Physiological Psychology (5).** Lec. 2, Lab. 10. Pr., PG 621.
Relation to physiological and anatomical, particularly neuroanatomical, variables to the organism's capacity to respond to stimulation.
645. **Comparative Psychology (5).** Lec. 2, Lab. 10. Pr., PG 623, 625, and 640.
Analysis of intra- and inter-species behavior emphasizing physical and physiological uniqueness, response comparability, and generalizability of behavioral principles.
650. **Theories of Learning (5).** Pr., PG 450 and 601.
Continuation of PG 450 emphasizing analysis of current issues.
656. **Behavior Modification (5).** Lec. 3, Lab. 4. Pr., PG 450, PG 620, and consent of instructor.
An examination of theoretical and technical issues in behavior modification. Laboratory practice will supplement classroom discussion.
670. **Assessment of Intelligence (5).** Lec. 3, Lab. 10. Pr., PG 416 and departmental approval.
Theories of intelligence; supervised practice in the administration and interpretation of individual intelligence tests.
671. **Personality Assessment I (5).** Lec. 3, Lab. 6. Pr., PG 670 and departmental approval.
Theory and application of methods of personality measurement with emphasis on interview and self-report data, and on the interpretation of tests of specific behavioral deficits.

672. **Personality Assessment II (5).** Lec. 3, Lab. 6. Pr., PG 671 and departmental approval.
Theory and application of methods of personality measurement with emphasis on projective techniques.
673. **Personality Assessment III. (Credit to be arranged.)** Maximum of 5 hours credit may be applied to minimum requirements for Master's degree.
Supervised practicum in personality assessment.
675. **Objective Techniques of Assessment (5).** Pr., PG 416 and 433.
Administration and interpretation of objective measures of aptitudes, performance, and personality.
676. **Teaching of Psychology (1-3).** Pr., departmental approval. May be taken more than one quarter; credit in this course cannot count toward fulfilling the minimum 45 graduate hours for a master's degree.
The problems and practices of teaching psychology at the college level. In addition to seminar meetings, students will work with senior faculty in appropriate courses. (Required course for NDEA Fellows.)
680. **Current Research in Psychology (2).** Pr., consent of instructor. May be repeated for a maximum of 10 hours credit.
Review of current research on selected topics in psychology. Six hours credit in this course required of all doctoral students.
690. **Seminar. (Credit to be arranged.)** May be taken more than one quarter but not more than one registration permitted in any one quarter.
692. **Research in Special Topics. (Credit to be arranged.)** May be taken more than one quarter but not more than one registration permitted in any one quarter.
699. **Research and Thesis. (Credit to be arranged.)** May be repeated for credit.
799. **Research and Dissertation. (Credit to be arranged.)** May be repeated for credit.

Secondary Education (SED)

Professors Atkins, Head, Davis, Scheid, and Weaver

Associate Professors Easterday and Justice

Assistant Professors Alley, Cheatham, Damewood, Graves, Robertson, and Yielding
Instructors Adams and Muniz

Undergraduate

102. **Orientation for Transfer Students (1).**
Helps transfers from other curricula and students enrolled in other schools to understand teacher education and teaching as a profession. (Students sectioned by area of specialization.) (A) Art, (C) Theatre, (D) Foreign Language, (G) English Language Arts, (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (M) Speech, (N) Speech Correction, (S) Undeclared Majors.
103. **Orientation for Freshmen (1).**
Helps freshmen in planning their professional careers. (Students sectioned by area of specialization.) (A) Art, (C) Theatre, (D) Foreign Language, (G) English Language Arts (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (M) Speech, (N) Speech Correction, (S) Undeclared Majors.
104. **Orientation to Laboratory Experiences (1).**
Required of all students completing the Teacher Education Program. Orientation to the Total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program. (Students sectioned by area of specialization.) (A) Art, (C) Theatre, (D) Foreign Language, (G) English Language Arts, (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (M) Speech, (N) Speech Correction, (S) Undeclared Majors.
201. **Education (2).**
Designed to help prospective teachers in the guidance of students. (A) Art Expression, (J) Music Experiences, (P) Communication Problems, (Q) Materials of Instruction, (R) Improvement in Reading.
- 201L. **Education (1). Lab. 2.**
Laboratory will be taken concurrently with the corresponding lecture course or independent of the lecture.

Curriculum and Teaching

Undergraduate students in secondary education with a teaching major and minor in secondary education only will take one course in Teaching and one course in Program in the major field and one course in either Teaching or Program in the minor field.

Students in secondary education may pursue a curriculum leading to certification for teaching in selected subject-matter fields in both the elementary and the second-

ary school. When this type program is pursued, certification requires that the student complete both the Teaching and the Program courses in the teaching field or fields in which certification is expected. Teaching fields for the twelve-grade program include health, physical education and recreation, industrial arts, and the subject-matter areas listed under Interdepartmental.

Teaching and Program courses may be scheduled and taught as separate courses, related courses, or as a unified program.

405. **Teaching in Secondary School (3). Lec. 2, Lab. 2. Pr., FED 320, or equivalent.**
(D) Foreign Language; (G) English Language Arts; (H) Mathematics; (K) Science;
(L) Social Science.
410. **Program in Secondary School (3). Lec. 2, Lab. 2. FED 320, or equivalent.**
(D) Foreign Language; (G) English Language Arts; (H) Mathematics; (K) Science;
(L) Social Science.
425. **Professional Internship in Secondary School (15). Pr., senior standing, Admission to Teacher Education prior to Internship, minimum of two appropriate Teaching and Program Courses.**
(D) Foreign Language, (G) English Language Arts, (H) Mathematics, (K) Science,
(L) Social Science. (See description under Professional Internship in School of Education section.)

Advanced Undergraduate and Graduate

475. **Problems in Improvement of Reading at the Secondary School Level (5). Pr., teaching experience or permission of instructor.**
Problem areas of effective reading instruction in developmental reading. Grades seven through twelve. Emphasis on techniques and materials for the teaching of comprehension, study skills, vocabulary, and other related areas in the reading program and in the content areas of the secondary school.
494. **Organization of Instrumental Music (3). Pr., IED 414.**
Theory and practice in the organization and administration of instrumental music in public schools.
495. **Organization of Choral Music (3). Pr., IED 414.**
Theory and practice in the organization and administration of choral music in public schools.

Graduate

646. **Studies In Education (1-3). Pr., one quarter of graduate study. May be repeated for credit not to exceed 3 hours. Applies to one of the following areas of secondary school program:**
(A) Art, (C) Theatre, (D) Foreign Language, (G) English Language Arts, (H) Mathematics, (J) Music, (K) Science, (L) Social Science, (M) Speech Communication, (N) Speech Pathology.
649. **The Secondary School Program (5).**
For advanced graduate students. Major curriculum areas and teaching practices in the modern secondary school. Attention given to implications of research and theory for the total secondary school program.
650. **Seminar. (3-10). May be repeated for credit not to exceed 10 hours.**
651. **Research Studies in Education in Areas of Specialization (5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.**
Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **Curriculum and Teaching in Areas of Specialization (5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.**
Critical study of teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **Organization of Program in Areas of Specialization (2-5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.**
Advanced course. Program, organization and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **Evaluation of Program in Areas of Specialization (2-5). Pr., 18 hours of appropriate subject matter and 36 hours of psychology and professional education.**
Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization with the total school program and with other educational programs of the community.
- Study in other teaching areas including art; gifted; mental retardation; music; speech communication, speech pathology; theatre; health, physical education and recreation; and industrial arts is available also to students in secondary education.

- 659-660. **Practicum in Area of Specialization (5-5). Pr., Master's Degree or equivalent in Education and permission of major professor.**
The practicum provides advanced graduate students with supervised experience with emphasis on the application of concepts, principles, and skills acquired in previous course work.
699. **Thesis Research. Credit to be arranged. May be taken more than one quarter.**
798. **Field Project. Credit to be arranged. May be taken more than one quarter.**
799. **Doctoral Research and Dissertation. Credit to be arranged. May be taken more than one quarter.**

Science

Undergraduate

453. **Science and Modern Living (5). Lec. 4, Lab. 2. Pr., junior standing.**
Interpretive course stressing the relationship of science to problems of personal and social living in modern technological society. The critical role of science in democracy.
473. **General Science for Teachers (5). Lec. 4, Lab. 2. Pr., junior standing.**
Gives the teacher essential knowledge of such fields as earth science, meteorology, astronomy, nuclear energy, which constitute significant aspects of the general science program.

Graduate

- 640-641. **Advanced Study of High School General Science. Pr., SED 473.**
Intensive study of selected topics from the area of the high school general science program.
- For advanced courses in curriculum, school library science, higher education, and research and dissertation, see IED.

Sociology (SY)

Professors Griessman, Head, and Hartwig
Associate Professors Dunkelberger and Shields
Assistant Professors Adams, Busch, French, Herrman, Littleford,
C. Vanlandingham, and J. Vanlandingham
Instructors Bradford and Hill
Lecturer Chase

201. **Introduction to Sociology (5). Pr., sophomore standing and qualified third quarter freshman with departmental approval.**
Principles and processes influencing the social life of man.
202. **Social Problems (5). Pr., SY 201.**
A sociological analysis of current social problems such as crime, mental illness, race relations, poverty, aging, etc.
203. **Introduction to Anthropology (5). Pr., sophomore standing.**
Presents the anthropological perspective from the four major fields of anthropology: physical, cultural, archaeological, and linguistic.
204. **Social Behavior (5). Pr., SY 201 or PG 211.**
Integrated social-anthropological, biological, and psychological factors which influence or determine human behavior; the emphasis is upon the normal individual and/or group situations.
207. **Introductory Archaeology (5). Pr., SY 201 or SY 203.**
The history, principles, and methods for investigating and reconstructing past cultures.
220. **Statistics (5). Pr., SY 201.**
Basic statistical concepts, measures, and techniques used in sociological reports and research.
301. **Sociology of the Family (5). Pr., SY 201 and junior standing.**
The family in cross-cultural perspective.
302. **Criminology (5). Pr., SY 201 and junior standing.**
The causes of crime and its social treatment. Field trips required.
303. **History of Anthropological Theory (5). Pr., SY 203.**
The development of ethnological theory.
304. **Minority Groups (5). Pr., junior standing.**
Racial composition of the United States with special emphasis on the adjustment of minority groups to the core society.
305. **Culture and Personality (3). Pr., SY 201.**
Socio-cultural factors in personality development and recent studies in national character.
306. **Penology (5). Pr., junior standing and SY 302.**
The history and development of corrections with particular emphasis upon modern rehabilitative processes.

308. **Juvenile Delinquency (3-5). Pr., SY 201.**
Historical and contemporary considerations relative to the juvenile offender. The emphasis is upon research data from the various sciences attempting to deal with this problem.
309. **Social Thought (5). Pr., junior standing and SY 201 or consent of instructor.**
Significant social thought leading to the emergence of modern sociological theory.
310. **Social Organization (5). Alternate years. Pr., SY 201 or consent of instructor.**
Focuses on the systems of roles, norms, and shared meanings that provide regularity in social interaction.
311. **Technology and Social Change (3). General elective. Pr., junior standing.**
Relationship between technological development and changes in modern society. Special emphasis placed upon the human relations aspects of modern science. Designed primarily to meet social science needs of students in the fields of engineering, agriculture, education, and the physical sciences.
312. **Marriage Adjustments (3). General elective. Pr., junior standing.**
Emotional, social and biological factors in the family setting with emphasis upon adjustments of marriage and parenthood.
370. **Methods of Social Research (5). Pr., SY 201 or RSY 361.**
The principal methods of data collection and analysis in sociological research. Same course as RSY 370. Credit in RSY 370 excludes credit in SY 370.
375. **Introduction to Social Welfare (5). Pr., sophomore standing.**
Historical survey of development of the social welfare system. Emphasizes political, economic, and social factors involved. Introduction to health and welfare services of local community.
401. **Population Problems (5). Pr., junior standing.**
Problems of quantity and quality of population including problems of composition, distribution, and migration. Attention is given to Alabama population.
402. **Social Theory (5). Pr., SY 201 or consent of instructor; junior standing.**
Survey of classical theorists from Comte to the present; emphasizes theory construction, theoretical analysis, and differences in theoretical approaches.
403. **Contemporary Anthropology (5). Pr., SY 203, junior standing.**
Contemporary research and theory regarding primitive, traditional, and urban cultures.
404. **Sociology of Power (5). Pr., SY 201, junior standing.**
A systematic concern with the dimensions and distribution of power in social life.
405. **Urban Sociology (5). Pr., junior standing.**
Growth and decline of cities with special emphasis on ecological and demographic characteristics, associations and institutions, class systems, and housing and city planning.
406. **Social Work (5). Pr., SY 375 or consent of instructor, and junior standing.**
The nature of social work. Attention given to the dynamics of client-worker relationship. Explores treatment techniques, concepts, and principles.
407. **Public Opinion and Propaganda (5). Pr., junior standing, SY 201.**
The area of social communication; the formation, place and importance of publics in modern society, of public opinion research, and of propaganda and public relations techniques.
408. **Industrial Sociology (5). Pr., junior standing, SY 201.**
The sociological approach to business organization and industrial relations. Emphasis given to organization principles operative in the economic life within a social system such as a factory or business establishment.
409. **Sociology of Religion (5). Pr., SY 201, junior standing, or consent of instructor.**
Analysis of religion as a social institution as found in the world's great religions. (To be offered in alternate years.)
410. **Sociology of Knowledge (5). Pr., SY 201 or consent of instructor.**
A review of sociological approaches to the understanding of human knowledge; a tracing of connections between knowledge and other facets of the sociocultural context.
412. **General Ethnology (5). Pr., junior standing.**
Surveys ethnological data from several societies in order to provide an understanding of the range and variability of cultural phenomena.
414. **Field Instruction (1-5). Pr., junior standing and consent of instructor.**
Supplementary instruction concurrent with field experience in some field of work involving application of sociological perspectives to community life.
415. **Social Stratification (5). Pr., SY 201, and junior standing.**
Stratification is a fundamental feature of all societies. Past thought and current research and theory on structured social inequalities is systematically developed.
418. **Sociology of Occupations (5). Pr., SY 201 and junior standing.**
A comprehensive examination of specific occupational categories ranging from professional to service occupations. Special emphasis is placed on the relationship of occupational structures and institutions and the meaning of occupations for individuals and society.

420. **Racial and Ethnic Relations (5).** Pr., 10 hours of SY, or consent of instructor, and junior standing.
Utilizes cross-cultural data to describe situations in which race or ethnicity affect human behavior. These data interpreted by delineating patterns, trends, and relationships.
422. **Special Topics in Sociology (1-5).** Pr., SY 201 or consent of instructor and junior standing. May be repeated for a maximum of 10 hours.
Examines selected topics from a sociological perspective.
424. **Special Topics in Anthropology (1-5).** Pr., SY 201 or consent of instructor and junior standing. May be repeated for a maximum of 10 hours.
Examines selected topics from an anthropological perspective.
450. **Directed Reading (1-5).** Pr., senior standing and consent of instructor.
An independent reading program, under supervision, to provide for the pursuit of specific interests in sociology not covered by other course offerings.

GRADUATE COURSES

602. **Seminar in the Family (5).** Pr., SY 301 or consent of instructor.
Study of the institutions of marriage, family, and kinship from a comparative and historical perspective.
603. **Social Problems (5).** Pr., SY 202 and consent of instructor.
Special social problems such as old age, crime and delinquency, minorities, etc., within the framework of social problem theory.
604. **Seminar in Race and Culture (5).** Pr., SY 201 and SY 304 or consent of instructor.
Adjustment of races to culture with particular reference to the South; the historical and cultural background of the races in America; bi-racial system; problems of race relations.
608. **Organizational Analysis (5).**
A theoretical and empirical examination of the principal features of large-scale organizations in contemporary society. Directed research into particular organizational areas of present-day social life.
650. **Sociology Seminar (5).** May be repeated for a maximum of 10 credit hours.
Pr., consent of instructor.
Designed for students engaged in intensive study and analysis of sociological subject areas.
NOTE: RSY 461 and RSY 462 are open to sociology majors; see Department of Agricultural Economics and Rural Sociology course offerings.

Speech Communication (SC)

Professors Davis, *Head*, and W. Smith
Associate Professor C. Smith
Assistant Professors Cornell, Overstreet, Phillips, Ritchey,
Sanders, and Taylor
Instructors Faircloth, Halle, James, Lopiccio, and Moss
Audiologists Gardiner and Sanderson

a. Foundations of Speech Communication

200. **Introduction to Undergraduate Study in Speech Communication (5).**
Acquaints the prospective speech major or minor with the fundamentals of speech, the historical, psychological, sociological, and other bases of speech.
201. **Speech Communication Theories (5).**
The nature, purposes, and process of oral communication. Theories of language, goals of various forms of oral communication are considered. Deviations from normal speech and special problems in communication are explored.
202. **Applied Speech Communication (3).** Lec. 2, Lab. 3.
To improve the efficiency and effectiveness of oral communication by covering the human organism as an oral communicator, the process of transmission and reception of information, the process of behavioral change and the ethical responsibilities involved.
401. **Psychology of Communication (5).** Pr., junior standing, one course in psychology.
Speech as a psychological phenomenon with consideration of language development, symbolism, verbal learning. Small groups and audience behavior and psychological studies in various areas of communication situations.
402. **Experimental Methods in Communication (5).** Pr., junior standing.
A survey and analysis of experimental and empirical research in communication with emphasis on experimental designs.
601. **Introduction to Graduate Study in Speech Communication (5).**
Exploration of areas in which research is needed; resources available; methods of research in speech; structuring the research problem; presenting the results of research in speech.

602. **Measurement in Communication Research (5).**
Response measurement techniques and their application to behavioral research in communication. Particular attention to attitudinal and electrophysiological phenomena.
- 603-604. **Development of Rhetorical Theory I, II (5-5). Pr., consent of instructor.**
Advanced studies in the historical development of writings, men, and movements. Materials selected from the periods: A. Ancient and Medieval; B. Renaissance and Modern.
606. **Seminar: Studies in Communication Theory (5).**
Contemporary theories and analysis of concepts, models and pertinent research in interpersonal communication. Consideration of selected topics.
607. **Independent Study (1-5). May be repeated for a maximum of 10 hours credit.**
Conferences, readings, research, and reports in one of the listed areas: A. public address; B. interpretation; C. mass communication; D. group methods; E. speech pathology; F. audiology.
608. **Seminar in Persuasion and Attitude Change (5).**
A critical examination of current theory and research in the area of the persuasive act and its effects. Particular attention to current departmental projects as examples of present research.
699. **Thesis. (Credit to be arranged.)**

b. Public Address

310. **Great American Speeches (3).**
Critical study and comparison of representative outstanding American speeches; the issues with which they were identified; their relation to the social scene.
311. **Public Speaking (5).**
Structure, style, and delivery of various types of speeches for different occasions, speeches to inform, to persuade, and to entertain. Theory and study of current examples combined with practice.
411. **Persuasive Speaking (5). Pr., junior standing and SC 202 or consent of instructor.**
Influencing individuals and audiences by means of spoken appeals. Salesmanship speaking. Analysis of forces which led to belief and action. Practice in organizing and presenting such appeals.
415. **Black Rhetoric (5). Pr., junior standing.**
Identification of important black speakers in America, understanding of the historical context in which these speakers functioned, and a delineation of the persuasive strategies employed.
613. **American Public Address I (5).**
Criticism of selected speakers, and speeches, 1750-1860, studied against a background of political, social, and intellectual issues.
614. **American Public Address II (5).**
Criticism of selected speeches and speakers, 1860 to present, studied against a background of political, social, and intellectual issues.
615. **Rhetorical Criticism (5). Pr., consent of instructor.**
The history and method of rhetorical criticism. Application of critical standards to selected men and their work.

c. Interpretation

220. **Fundamentals of Oral Interpretation of Literature (5).**
Oral readings of prose, poetry and drama, enhancing the student's understanding and appreciation of the art of literature by engaging him actively in reading the literary text aloud.
421. **Oral Interpretation of Prose and Drama (5). Pr., junior standing and SC 220 or consent of instructor.**
Develops skill in the oral reading of prose and drama. Study of theories concerning the sound, sense, and performance of these two types of literature.
422. **Oral Interpretation of Poetry (5). Pr., junior standing and SC 220 or consent of instructor.**
Theories concerning problems in reading verse, criticism and performance; modes of group performance are included.
620. **Development and Theory of Interpretation (5).**
The growth and change of theories regarding oral interpretation.

d. Mass Communication

230. **Introduction to Broadcasting (5).**
The history, growth, and development of broadcast communications and the legal, social, and political aspects of broadcasting.
234. **Broadcast Production Techniques—Radio (5). Pr., consent of instructor.**
Analysis of the creative efforts and responsibilities in the primary stages of broadcast production. Practice in writing, producing, directing, performing, and crewing radio productions and taped material.

235. **Modes of Film Communication (5).**
The film industry's contribution to television and other forms of mass communication; an analysis of the styles and forms of film production as entertainment, communication, education, and art.
335. **Cinema and Society (5). Pr., SC 235 or consent of instructor.**
The role of film, its history, contributions and effectiveness as an area of expression and communication; an analysis of the social, artistic, economic and cultural factors which have influenced the film.
336. **Television Production-Direction I (5). Pr., consent of instructor.**
Individual and group projects in the development and production of programs and formats; an intense study of directing theory and the director's role through presentation of educational and dramatic materials.
337. **Film Production I (5). Pr., SC 235 or consent of instructor.**
Studies in both theory and principles of film making. Special instruction given through practical application of silent film to the problems of production planning, writing, direction, cinematography, and editing.
338. **Broadcast News Writing (5). Pr., consent of instructor.**
Writing and editing news and informational materials for television and radio. Students solicit and prepare news from and for local sources.
- 431-432. **Mass Communication Workshop (3-3). Pr., departmental permission.**
Experience as a part-time staff member with an approved local station or production company.
436. **Television Production-Direction II (5). Pr., junior standing and SC 336.**
Individual and group projects in the creation of program material with special emphasis on the writer-producer and his role in the industry.
438. **Television-Radio-Film Writing (5). Pr., junior standing and consent of instructor.**
The technique of writing dramatic and non-dramatic material for television, radio, and films. Special emphasis is placed on performance. Students may elect to emphasize one area.
439. **Mass Communication Internship (6). Pr., departmental permission.**
A full-time internship with an approved station or production company; serving as a regular staff member under the supervision of the station manager and direction of an Auburn University faculty member.
630. **Studies in Mass Communication (5). Pr., consent of instructor.**
Combined media and their relationship with speech and communication.
631. **Development of American Broadcasting (5). Pr., consent of instructor.**
The origin of radio and television broadcasting and its development to the present day.
632. **Broadcast Programming and Criticism (5). Pr., consent of instructor.**
The theory and practice of programming, its problems and concepts, coupled with an analysis of the criticism leveled at the process and the product.
633. **Broadcast Regulations (5).**
The social and political control of broadcasting by agencies, groups, and organizations through legal, social, and economic means.

e. Speech and Audiology

(Speech Pathology)

340. **The Speech and Hearing Mechanism (5).**
Anatomy and physiology of the speech and hearing mechanism.
341. **Phonetics (3). Lec. 2, Lab. 3.**
Principle of phonetics and their application to speech.
355. **Clinical Procedures in Speech (1-3). May be repeated for credit.**
Orientation and an introduction to supervised clinical activity in the area of speech disorders. Clinical practice required.
450. **Principles of Speech Correction (5). Pr., junior standing.**
Not open to students emphasizing or majoring in speech correction and audiology. Basic principles underlying a speech correction program in a school setting. Description and discussion of speech disorders; surveys and identification techniques.
451. **Speech Correction I (5). Pr., junior standing and consent of instructor.**
The nature of the speech correction process with emphasis on disorders of articulation. Participation in clinic activities required.
452. **Speech Correction II (5). Pr., junior standing and consent of instructor.**
Continuation of SC 451 with emphasis on vocal disorders and disorders of rhythm. Participation in clinic activities required.
453. **Speech Correction III (5). Pr., junior standing and consent of instructor.**
Emphasis on disorders of symbolization and delayed language development. Participation in clinic activities required.

650. **Pathology (4).** Pr., SC 453 or consent of instructor. May be repeated for credit. Advanced studies dealing with disorders of speech. Materials may be drawn from: A. cerebral disturbances (aphasia and cerebral palsy); B. palatolaryngeal disturbances (esophageal and cleft palate); C. voice disorders; D. stuttering; E. articulation (including dialect); F. delayed speech development.
655. **Clinical Problems in Speech (1-3).** Pr., SC 453 or equivalent. May be repeated for credit. Methods, techniques, and clinical management of the disorders of speech. Clinical practice required.
658. **Field Experience in Speech Pathology (5-10).** May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree. Full-time assignment in a speech and hearing facility, the choice being made from the following settings: University Speech and Hearing Clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults.

(Audiology)

365. **Clinical Procedures in Hearing (1-3).** Orientation and an introduction to supervised clinical activity in the area of hearing disorders. Clinical practice required.
460. **Introduction to Audiology (5).** Pr., junior standing. Principles of auditory reception, the hearing mechanism and the problems involved in measuring, evaluating, and conserving hearing. Clinical observation.
461. **Hearing Pathology (5).** Pr., SC 460 or equivalent and junior standing. Evaluation and rehabilitation of aural handicapped children and adults; hearing aids and hearing training. Clinical practice.
462. **Hearing Evaluation, Rehabilitation and Conservation (5).** Pr., junior standing, SC 461 or consent of instructor. Detailed concern for the rehabilitation problems of children and adults in the area of auditory training, speech reading and speech conservation. Clinical practice.
660. **Audiology (4).** Pr., SC 460 or consent of instructor. May be repeated for credit. Advanced studies dealing with the disorders of hearing. Materials drawn from: A. speech reading; B. aural rehabilitation; C. clinical audiology; D. child and adult rehabilitation; E. hearing aid orientation; F. teaching speech and language to the deaf.
665. **Clinical Problems in Hearing (1-3).** Pr., SC 460, 461, or equivalent. May be repeated for credit. Methods, techniques, and clinical management of the disorders of hearing. Clinical practice required.
668. **Field Experience in Audiology (5-10).** May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree. Full-time assignment in a speech and hearing facility, the choice being made from the following settings: University Speech and Hearing Clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults.

f. Group Communication

270. **Group Leadership (3).** Nature and functions of group leadership; the role of democratic leadership in organizing and conducting a group meeting to reach group aims. Students gain leadership experience in class activities to help them learn and perfect democratic leadership techniques.
273. **Group Problem Solving Through Discussion (5).** Group problem solving through discussion. The values and limitations of discussion, the prerequisites of reaching agreement, and a systematic approach to solving problems in group discussion. Leadership in problem solving.
275. **Debate Workshop (1).** May be repeated for a maximum of 3 credit hours. Introduction to the national debate question for beginning debaters interested in competition debate. Lecture and practical work.
278. **Argumentation and Debate (5).** Debating techniques and procedures; their application to issues of current public interest; the gathering, organization, and presentation of facts, proofs, evidence.
371. **Parliamentary Procedure (3).** To aid the individual who may lead or participate in discussions or organizations where orderly procedure is needed. Theory and practice both employed.
375. **Debate Workshop (1).** May be repeated for a maximum of 3 credit hours. Advanced study of the national debate question for experienced debaters. Analysis of logical, ethical and emotional proofs in competition debate. Lecture and practical work.

673. Seminar in Discussion (5).

Group problem-solving through discussion as a tool of the democratic leader. Survey of published experimental work in discussion; consideration of the values and limitations of the discussion process. Special attention to application of group problem-solving in education, business, industry, and agriculture.

678. Seminar in Debate (5).

Psychological concepts of argument. Techniques and methods employed in argumentative discourse. Critical analysis of selected controversies and a survey of published experimental work in debate.

Technical Services (TS)

Professor Haynes, *Head*

Associate Professors Blakney, McClung, Goolsby, Little, Thornton, and Ingram

Assistant Professors Conner, McMurtry, Clement, and Wingard

100. Introduction to Manufacturing Processes (2). Lab. 6.

Laboratory oriented studies in economic production principles related to metal and plastic product manufacturing.

102. Engineering Drawing I (2). Lab. 6. Pr., Plane Geometry.

Use of instruments; lettering practice; geometric constructions; principal views in projection; auxiliary and section views; dimensioning; detail working drawings; and isometric projection.

104. Descriptive Geometry (2). Lab. 6. Pr., TS 102 and Solid Geometry.

Basic principles pertaining to points, lines, and planes; including problems on sections, developments, and intersections of solids.

105. Engineering Drawing II (2). Lab. 6. Pr., TS 102.

Technical sketching; reading analysis of shop drawings, machine parts, detail and assembly drawings; types and arrangement of materials; titles and symbols; tracings, printing, and other reproduction methods; steel and timber structures; riveting and welding.

106. Graphical Methods (2). Lab. 6. Pr., TS 102 or one credit of Mechanical Drawing in an accredited high school.

Technical sketching, slide rule, statistics and graphical analysis, digital and analog computers and vectors. This course is designed to present the fundamental graphical concepts and related materials as they apply to modern technology and engineering.

111. Woodworking (1). Lab. 3.

Introduction to machines, tools, and materials used in working with wood and plastic.

112. Welding Science and Application (1). Lab. 3.

Basic principles and application of welding and cutting processes in the fabrication of metals.

113. Machine Tool Laboratory (1). Lab. 3.

Introduction to metal removal processes; basic machines of production.

114. Sheet Metal Design and Fabrications (1). Lab. 3.

Methods and equipment used in design, production and fabricating of sheet metal products.

115. Foundry Technology (1). Lab. 3.

Basic fundamentals involved in casting products of ferrous and non-ferrous metals.

204. Kinematics of Machines (3). Lec. 2, Lab. 3. Pr., TS 104, TS 105 and coreq., PS 220. Spring Quarter.

Graphical analysis of the fundamental elements of machines, including: definitions, velocity and acceleration diagrams, methods of transmission of motion by links, cams, gears, gear trains, and flexible connectors.

205. Applied Graphic Statics (2). Lec. 1, Lab. 3. Pr., TS 105 and coreq., PS 220.

Resultants and equilibrium of concurrent, parallel and non-parallel forces; moments of parallel forces; general cases of reaction of coplanar forces; stresses in simple trusses by joint and section methods; cranes, derricks, dredges, and frames with bending members; static forces in machines with and without friction.

206. Technical Sketching (2). Lab. 6. Pr., TS 104 and TS 105.

Technical lettering, block and architectural; types of illustrations, purpose and use; sketching techniques; pictorial drawings, oblique, isometric, dimetric, trimetric, perspective; shading; use of the airbrush; charts; reproductions of drawings.

306. Advanced Graphics for Engineers (3). Lec. 2, Lab. 3. Pr., TS 104, MH 361.

Vector geometry, functional scales, nomography, combination of observations, empirical equations, and graphical calculus.

307. General Metals (5). Lec. 3, Lab. 4. Pr., consent of instructor.

Design, construction and finishing art metal projects.

308. Gages and Measurements (5). Lec. 4, Lab. 2.

The science of measurement as applied to production and inspection of industrial products.

402. Advanced Woodworking (5). Lec. 3, Lab. 4. Pr., TS 111.

Studies in design, construction, and finishing fine objects of wood.

403. **General Shops (5). Lec. 5. Pr., senior standing.**
Problems of organization of unit shops into integrated whole for effective use in secondary school teaching.
405. **Problems in Welding Engineering (5). Lec. 3, Lab. 4. Pr., TS 112.**
Advanced phases and techniques of welding and allied processes. Problems in design, weldability of metals, inspection practice, and selection of equipment.
406. **Problems in Machining (5). Lec. 3, Lab. 4. Pr., TS 113.**
Advanced phases of metal machining with emphasis on production machines and accessories.
409. **Utilization of Machine Tools in Research and Development (1). Lab. 3.**
Instruction in the use of machine tools for machining, fabricating and finishing components and assemblies of working models for developmental projects.

Advanced Undergraduate and Graduate

415. **Shop Work for Elementary Teachers (5). Lec. 2, Lab. 6. Pr., junior standing.**
Methods, materials, and techniques involved in conducting activity programs in schools and recreational centers.
416. **Materials of Industrial Arts (5). Lec. 5. Pr., senior standing.**
History and use of various materials used in industry.
417. **Organization of Shop Courses (5). Lec. 5. Pr., senior standing.**
Organization and administration of the Industrial Arts program in the public schools.
418. **Industrial Arts Design (5). Pr., senior standing.**
Fundamentals of design as applied to Industrial Arts programs.
450. **Engineering Metrology (1-5). Pr., junior standing and departmental approval.**
Studies in design, construction, and use of precision measuring equipment and gages.

Graduate Courses

- 611-12. **Technical Problems in Industrial Arts (5-5). Pr., graduate standing.**
Advanced study of technology and method in selected areas of Industrial Arts.

Textile Engineering (TE)

Professors Adams, *Head*, Knight, and Waters
Associate Professors Farrow and Hall
Assistant Professors Phillips, Walker, and Perkins

101. **Introduction to Textiles (1).**
Orientation course for freshmen which briefly introduces all branches of the textile industry.
210. **Fiber Processing (5). Lec. 4, Lab. 2.**
Construction and operation of equipment for opening, cleaning, blending, picking, carding, combining, drawing, adaptation of these processes to synthetics and wool; calculations necessary for the planning and operation of this equipment.
211. **Yarn Manufacture I (5). Lec. 4, Lab. 2. Pr., TE 210.**
Construction and operation of roving and spinning equipment for cotton, wool, and synthetics long draft systems and drafting, systems for blends, etc.
220. **Weaving and Designing I (5). Lec. 4, Lab. 2.**
Automatic cam loom mechanism with design of fabrics made on these looms.
230. **Basic Fabric Structure and Design (5). Pr., sophomore standing.**
The formation of cloth on basic loom mechanisms is presented prior to the study of fabric design, construction and identification. Special fabrics through the use of color, finishes and weaves are covered.
305. **Fiber Technology (3). Lec. 2, Lab. 2. Pr., sophomore standing.**
Origin, characteristics, and properties of the various textile fibers, both natural and man-made; fiber microscopy.
307. **Bleaching and Dyeing (5). Lec. 4, Lab. 2.**
Bleaching, dyeing and finishing of natural and man-made fiber fabrics; all types of dyes for textiles, their application and fastness.
317. **Dyeing and Finishing (5). Lec. 4, Lab. 2. Pr., TE 307.**
Plant application methods and plant problems in dyeing, finishing and printing of natural and man-made fibers.
319. **Chemical Testing (2). Lec. 1, Lab. 2. Pr., junior standing.**
Theory and practice of testing of textile materials by chemical means; physical tests related to chemical properties, qualitative and quantitative analysis of textile materials.
320. **Weaving and Designing II (5). Lec. 4, Lab. 2. Pr., TE 220.**
Dobby and multibox operation, pattern planning, and designs applicable to dobbie and box looms.

321. **Weaving and Designing III (5). Lec. 4, Lab. 2. Pr., TE 320.**
Special weaving attachments, and production of specialty fabrics. Weaving mill organization. Fabric identification.
322. **Yarn Manufacture II (5). Lec. 4, Lab. 2. Pr., TE 210 and TE 211.**
Methods of obtaining higher quality yarns; yarn production planning; practical manufacturing problems; yarn mill machinery layout and labor organization.
324. **Physical Testing (3). Lec. 2, Lab. 2. Pr., junior standing.**
Basic principles for measuring properties of natural and man-made fibers, yarns, and fabrics with use of laboratory testing equipment for familiarization with test methods.
325. **Textile Quality Control (2). Pr., TE 210, TE 211, EC 245; Coreq., TE 324.**
The practical use of statistics and quality control in the textile industry with emphasis on statistical control techniques.
330. **Survey of Knitting and Tufting (5). Pr., TE 211.**
Knitting background, terminology and the study of basic principles and mechanisms for for welt and warp knitting. Carpet manufacture with emphasis on terminology and principles involved in tufting.
405. **Warp Preparation (5). Lec. 4, Lab. 3. Pr., junior standing.**
Spooling, warping, and slashing of natural and synthetic yarns; chemistry of starches and synthetic polymers used as warp sizes; analysis of problems associated with preparation of warp yarn for weaving.
406. **Textile Costing (5). Pr., junior standing.**
Basic principles for figuring textile production costs; allocation of costs; fabric cost sheet; marketing costs.
412. **Textile Management (3). Pr., senior standing.**
A practical business management approach to the analysis and solution of problems in the textile industry. The major areas of concern to management are discussed, including policy determination, organization structure and analysis, employment function, manpower development, financing, purchasing, production, merchandising, industrial and public relations, etc.
417. **Advanced Dyeing (5). Lec. 4, Lab. 2. Pr., TE 317.**
Survey of major dye classes from a chemical standpoint; basic principles of color, color specification, color matching, and instrumentation; thermodynamic and kinetic study of the dyeing process.
418. **Jacquard Weaving and Design (2). Lec. 1, Lab. 2. Pr., TE 220.**
Jacquard mechanism and design of original patterns for jacquard loom.
424. **Man-Made Fibers I (5). Pr., junior standing.**
An introduction to the more important man-made fibers and polymer forming substances, and their considerations in the employment in fibers and blends.
425. **Man-Made Fibers II (5). Pr., TE 424.**
A continuation of TE 424. A further study of the relationships between fiber structure and geometry, and technological aspects on their properties and uses.
431. **Fabric Analysis (3). Lec. 2, Lab. 2. Pr., TE 320.**
Analysis of fabric structure and determination of specifications.

Theatre (TH)

Professor Harrison, *Head*
Associate Professor Comeau
Assistant Professor Torri
Instructor Koellsted

- 101-2-3. **Introduction to the Arts (1-1-1).**
A survey of the arts with emphasis on the interrelation between the various creative areas of Art, Music, Theatre, Architecture, etc. from the position of the artist and the observer.
104. **Introduction to Theatre I (3).**
Theatre as an art form, a broad introduction involving general aesthetics, philosophy, and history.
105. **Introduction to Theatre II (3).**
A continuation of 104 with special emphasis on analysis of theatre as an art form requiring multiple talent resources.
106. **Introduction to Theatre III (1). Pr., 104, 105.**
A continuation of 105 with special emphasis on dramatic literature, artists, movements, and stage practices of the nineteenth and twentieth centuries.
107. **Stage Craft I (1).**
An introduction to technical theatre as the craft of scene construction. Weekly laboratory work, with a minimum of 30 hours during a quarter under staff supervision.

108. Stage Craft II (1). Pr., 107.

A continued application of scene construction techniques. Weekly laboratory work, with a minimum of 30 hours during a quarter under staff supervision.

109. Stage Craft III (1). Pr., 107, 108.

An introduction to technical theatre as the craft of lighting and electronics.

111. Theatre Practice (1).

For students selected by faculty directors for work in University Theatre activities. One hour's credit in any field of theatre—acting, directing, technical production, design, or theatre management—in any one quarter. Total credit allowed: six hours. Work completed in this course must be exclusive of laboratory hours required in other theatre courses.

199. Theatre Laboratory (2). Pr., 109.

General laboratory work (a minimum of 45 hours under staff supervision during a quarter). A course open to students who have completed Stage Craft sequence and who are interested in working on the theatre season of the Department in any production capacity. May be repeated for a maximum credit of six quarter hours.

201. The Theatre Artist in Society (3).

A historical examination of the role and place in society of the theatre artist with emphasis on recurring problems of orientation and acceptance.

203. Theories of Acting (3).

The theoretical aspects of acting to include writings from the time of Aristotle to the present day.

204. Fundamentals of Acting I: Voice (5).

Developing the voice as a performing instrument.

205. Fundamentals of Acting II: Movement (5).

Developing the body as a performing instrument.

206. Acting I (5). Pr., 204, 205, or equivalent.

A first course in acting involving the skills acquired in 204 in short acting sequences.

207. Stage Make-up (3).

A practical course in the design and application of theatrical make-up for stage purposes.

301. History of Theatre in Western Civilization (3).

The theatre as literature, institution, and architecture as it has existed from earliest times to the end of the medieval period.

302. History of Theatre in Western Civilization (3). Pr., 301.

The theatre as literature, institution, and architecture as it has existed in Western culture from the end of the medieval period until the mid-nineteenth century.

303. History of Theatre in Western Civilization (3). Pr., 301, 302 or equivalent.

The theatre as literature, institution, and architecture in Western civilization from the mid-nineteenth century to the present day with emphasis on theatre in America.

304. Fundamentals of Stage Design (5).

The basic considerations involved in all aspects of the performer's stage environment.

305. Design in the Theatre I (5). Pr., 304 or equivalent.

A continuation of fundamental design concepts with emphasis on stage lighting.

306. Design in the Theatre II (5). Pr., 304, 305, or equivalent.

Practice in stage design.

307. Children's Theatre (3).

Theatre for children involving an examination of play scripts, acting, and production techniques.

308. Creative Dramatics (3).

The dramatic instincts of pre-school and early elementary school children in the light of contemporary theory and practice in this area.

309. Costume (3).

The design and construction of elementary stage costumes.

310-11-12. Dramatic Production (3-3-3). Lec. 2, Lab. 6. Only students approved by the department head may register for these courses.

Advanced acting.

313. Theatre Appreciation I (3). General Elective. Not open to Theatre Majors.

A survey of the theatre and stagecraft from early times to the present day, emphasizing the social and artistic position of the stage in each civilization.

314. Theatre Appreciation II (3). General Elective. Not open to Theatre Majors.

A survey of contemporary plays and productions.

401. Play Analysis (3).

An examination of play scripts emphasizing interpretation from the viewpoint of directorial theory.

403. Seminar and Theatre Research (3).

The past and present patterns of research in all areas of theatre and practice.

404. **Directing I (5).**
Introductory basic theory and technique of directing theatre productions.
405. **Directing II (5).**
A continuation of 404 involving practical exercises in directing.
406. **Directing III (5).**
Provides the student with several directing problems which must be solved through the completion of a directing project. Prerequisites 404, 405 or equivalents.
407. **Acting II (5). Pr., 204, 205, 206, or equivalent.**
Specialized areas of acting theory and technique with emphasis on acting theoreticians of the twentieth century.
408. **Problems in Aesthetic Design (5). Pr., 304, 305, 306, or equivalent.**
An intensive study of stage design problem solving based on the works of design theoreticians of the twentieth century.
409. **Directing IV (5). Pr., 404, 405, or equivalent.**
Directing theory based on the detailed analysis of the work and writings of selected twentieth century directors.
- 410-11-12. **Dramatic Production (3-3-3). Lec. 2, Lab. 6. Pr., approval of department head.**
Seminar and workshop in Advanced Acting.
414. **Modern Theatre Backgrounds (3).**
A study of the leading artists, concepts, and movements in Continental theatre which have affected playwriting and play production in the twentieth century.
425. **Theatre Practice in the School (5). Pr., senior or graduate standing.**
Theatre resources and methods for the teacher who selects, plans, coaches, and produces plays, classroom and assembly programs.
426. **Theatre Practice in the School (5). Pr., 425, or approval of department head.**
Practical application of theatre resources and methods in the production of plays, classroom and assembly programs for school purposes.
427. **Introduction to Theatre Management (5).**
An introduction to the field of theatre management with emphasis on elementary procedures involving sales and advertising management.
428. **Personnel Management in Theatre (5).**
Personnel management in theatre involving study of the union regulations of Actor's Equity of America, the Screen Actor's Guild and international unionized performing.
429. **Theatre Plant Management (5).**
Theatre plant management involving a study of design in relation to security, insurance and urban development.

Veterinary Medicine (VM)

Anatomy and Histology

Professor Holloway, *Head*

Associate Professor McKibben

Assistant Professors James and Krista

Instructors Guenther, Engel, Reynolds, Rumph and LaFaver
Technician Dennis

Microbiology

Professor Kramer, *Head*

Associate Professors Attleberger and Miller

Assistant Professor Kelley

Instructor Merritt

Lecturer Christenberry

Technicians Summers and Hall

Pathology and Parasitology

Professors Groth, *Head*, Morgan, and Roberts
Associate Professors Benz, Hoff, Powers, Shields**, Rossi, and Teer
Assistant Professors Diamond and Giles
Research Lecturers Davis, Frandsen, and Ernst
Technicians Guthrie, McConnell, Naftel, and Wallace

Physiology and Pharmacology

Professors Clark, *Head*, Burns, and Redding
Associate Professors Alexander and Beckett
Assistant Professors Pedersoli and Robertson
Instructor Sims
Technician Barron
Graduate Teaching Assistant Smith
Research Associate Branch

Radiology Section

Associate Professor Bartels
Instructor Boring

Large Animal Surgery and Medicine

Professors Schell, *Head*, Gibbons, Kiesel, Walker, and Wiggins
Associate Professors Winkler**, Kjar, and Johnson
Assistant Professor Hudson
Instructors McCormack, Peet, Merriam, and Nolen
Research Associates Shires, and Klyza

Small Animal Surgery and Medicine

Professors Hoerlein, *Head*, Horne, and Redding
Assistant Professors Albert, Ellington and Hanks
Instructors Milton, Rucker, and Swaim
Intern Gumfory
Technicians Sellers and Lucassen

Veterinary Medicine (VM)

210. **Human Physiology (5). Lec. 3, Lab. 4. All quarters.**
Functions and manner of operation of the body and its parts, with special emphasis on digestion, circulation and reproduction. Laboratory exercises illustrate the functions of the various organ systems of the body.
220. **Human Anatomy and Physiology (5). Lec. 3, Lab. 4. Summer, Fall and Winter.**
For students in Laboratory Technology and others who are qualified. Human skeletal, muscular and nervous systems. Human models, cats and frogs are used in laboratory to supplement lecture material.
221. **Human Anatomy and Physiology (5). Lec. 3, Lab. 4. Winter and Spring.**
Anatomy and physiology related to the heart, circulation, blood, digestion, metabolism, kidney, respiration, endocrines and reproduction.
300. **Orientation (2). Fall.**
Dynamics of professional responsibilities, duties and privileges of the veterinarian.
313. **Physiology I (4). Lec. 4. Fall.**
Chemistry and metabolism of fats, carbohydrates and proteins.
- 313L. **Physiology Laboratory I (1). Lab. 2. Fall.**
Experiments on cell biology and metabolism.
314. **Physiology II (2). Lec. 2. Fall. Pr., VM 313-313L.**
Cell biology, statics, and the application of engineering and physics in Veterinary Medicine.

**On Leave.

315. **Physiology III (4). Lec. 4. Winter. Pr., VM 314.**
Cardiovascular, body water, electrolytes, and renal physiology. Pharmacodynamics of cardiovascular and renal drugs.
- 315L. **Physiology Laboratory II, (1). Lab. 4. Winter.**
Experiments on renal, cardiovascular and digestive physiology.
316. **Physiology IV (2). Lec. 2. Winter. Pr., VM 315-315L.**
Physiology of blood, digestion, and liver.
317. **Physiology V (3). Lec. 3. Spring. Pr., VM 316.**
Radiobiology and Endocrinology.
- 317L. **Physiology Laboratory III (1). Lab. 2. Spring.**
Laboratory experiments in radiobiology, reproduction, endocrinology and pharmacology.
318. **Physiology VI (2). Lec. 2. Spring. Pr., VM 317-317L.**
Physiology of reproduction.
319. **Pharmacology I (1). Lec. 1. Spring. Pr., VM 318.**
Pharmacology of cardiovascular and renal drugs.
- 320-321-322. **Anatomy I, II, III (5-5-5). Lec. 2, Lab. 10. Fall, Winter, Spring.**
Gross anatomy of domestic animals. A progressive study of the gross structures of the dog, cat, ox, horse, hog, fowl, laboratory animals, and zoo animals.
326. **Histology (5). Lec. 2, Lab. 6. Fall.**
Microscopic anatomy of the form, structure, and characteristics of the basic tissues of animals.
327. **Organology (5). Lec. 2, Lab. 6. Winter. Pr., VM 326.**
Microscopic anatomy of the tissue composition of organs and organ systems.
328. **Embryology (4). Lec. 2, Lab. 4. Spring. Pr., VM 327.**
Microscopic anatomy of the reproductive organs. Formation and early development of the embryos of domestic animals. Fetal membranes and placentation are emphasized.
330. **General Microbiology (4). Lec. 2, Lab. 4. Winter 1972-73.**
Only required for veterinary students without credit in general microbiology.
331. **Veterinary Microbiology I (4). Lec. 2, Lab. 4. Spring.**
Veterinary Immunology for students in Veterinary Medicine.
421. **Animal Physiology (5). Winter.**
Physiology of the farm animals with special emphasis on digestion, endocrinology and reproduction.
422. **Animal Disease Control (5). Spring. Pr., VM 421 and General Microbiology.**
Herd management and practices proven to be of value in the prevention and control of the important diseases of farm animals.
430. **Veterinary Radiology (3). Lec. 3. Spring.**
Basic diagnostic radiology including interpretations, techniques, therapy and equipment.
436. **Pharmacology II (3). Lec. 2, Lab. 2. Fall. Pr., VM 319.**
Pharmacology of general anesthetics.
437. **Pharmacology III (4). Lec. 3, Lab. 2. Winter. Pr., VM 436.**
Systematic pharmacology.
443. **Physiology VII (4). Lec. 3, Lab. 2. Fall. Pr., VM 318-319.**
Neurology, respiratory physiology and the pharmacodynamics of drugs affecting the central nervous system.
444. **Physiology VIII (3). Lec. 2, Lab. 2. Winter. Pr., VM 443.**
Neurology, and the pharmacodynamics of drugs affecting the central nervous system.
450. **Pathology I (6). Lec. 4, Lab. 4. Fall. Pr., VM 322 and VM 328.**
Disease processes affecting animals with emphasis on the gross and microscopic changes in cells, tissue organs, and systems.
451. **Pathology II (5). Lec. 3, Lab. 4. Winter. Pr., VM 450.**
Continuation of VM 450.
452. **Pathology III (4). Lec. 3, Lab. 2. Spring. Pr., VM 451.**
Continuation of VM 451.
454. **Laboratory Animal Medicine (3). Lec. 2, Lab. 2. Spring. Pr., VM 450 and VM 451.**
Management, utilization, and diseases of the common laboratory mammals including rats, mice, guinea pigs, hamsters, rabbits, and nonhuman primates.
456. **Veterinary Parasitology I (4). Lec. 3, Lab. 2. Fall.**
Introduction to parasitology including internal and external parasites of domestic animals.
457. **Veterinary Parasitology II (5). Lec. 4, Lab. 2. Winter. Pr., VM 456.**
Continuation of VM 456.
460. **Veterinary Microbiology II (4). Lec. 2, Lab. 4. Pr., VM 331. Fall.**
Bacteriology of Veterinary Pathogens.
461. **Veterinary Microbiology III (4). Lec. 2, Lab. 4. Winter. Pr., VM 331 and VM 460.**
Veterinary Virology.

- 465. Veterinary Public Health I (4). Lec. 3, Lab. 2. Spring.**
Principles of epidemiology, selected diseases of animals transmissible to men and the relationship of the veterinarian to public health and animal disease control agencies.
- 499. Veterinary Medicine I (5). Lec. 5. Spring.**
Detailed study of the etiology, symptoms, pathogenesis, diagnosis, treatment and prevention of the medical diseases affecting the various systems and organs of the equine, bovine, ovine and porcine species.
- 500. Veterinary Medicine II (5). Lec. 5. Fall.**
Continuation of VM 499 and includes nutritional deficiency diseases.
- 503. Veterinary Surgery I (3). Lec. 3. Fall.**
Background of surgery; major surgical injuries — wounds, fluid loss and infection; preoperative and postoperative care; surgical techniques; anesthesia; and extirpative, reconstructive and physiologic surgery.
- 504. Veterinary Surgery II (3). Lec. 3, Lab. 1. Winter.**
Special surgical diseases of the domestic farm animals including surgery of the alimentary canal, the chest and abdomen, the respiratory and cardiovascular systems, the eye and ear, the genito-urinary tract, and the feet and limbs.
- 507. Clinical Pathology (4). Lec. 2, Lab. 4. Winter. Pr., VM 452.**
Methods for the collection, preservation and examination of various body fluids including blood and urine. Interpretation of results is directed toward clinical diagnosis and prognosis.
- 510. Veterinary Medicine & Surgery I (5). Fall.**
The diagnostics, medical and surgical treatment of the gastrointestinal, genitourinary, cardiovascular, pulmonary, and integumentary systems of small domestic animals.
- 511. Veterinary Medicine & Surgery II (5). Winter. Pr., VM 510.**
The diagnostics, medical, and surgical treatment of the endocrine, musculo-skeletal, nervous systems and the special sense organs in small domestic animals.
- 512. Veterinary Surgery III (1). Lab. 2. Fall. Pr., VM 510.**
Introductory laboratory on basic surgical asepsis, anesthesia, and techniques.
- 519. Veterinary Medicine & Surgery III (3). Lec. 3. Spring. Pr., VM 510-511.**
The systemic diseases and clinical immunologic procedures in small domestic animals.
- 526. Clinics I (2). Lec. 1, Lab. 4. Fall.**
Demonstration and practice of handling, restraint, physical diagnosis, and administration of therapeutic agents related to large animals.
- 527. Clinics VI (2). Lec. 1, Lab. 4. Fall.**
Demonstration and practice of handling, restraint, physical diagnosis, and administration of therapeutic agents related to small animals.
- 530-531. Veterinary Jurisprudence and Ethics (1-1). Fall and Winter.**
Laws relating to the veterinary profession. Professional ethics for the veterinarian.
- 542. Applied Anatomy (1). Lab. 2. Winter.**
Anatomy related to diagnostic, obstetrical, and surgical procedures.
- 550. Theriogenology (5). Lec. 5. Spring.**
Clinical application of the physiology of reproduction, causes and correction of dystocia, genital examinations, and infertility of the male and female.
- 553. Special Anatomy (1 to 5). Hours and credit to be arranged. Pr., VM 320.**
Elective course in which any phase of anatomy of domestic animals to the anticipated field of specialization may be studied.
- 554. Veterinary Medicine III (5). Spring.**
Identification and study of selected poisonous plants of the U. S. and common chemical and venom poisoning of farm animals and pets. To include characteristic signs, lesions, methods of diagnosis, and treatment.
- 555-556. Veterinary Medicine IV, V (5-5). Winter and Spring.**
Principal infectious diseases of large domestic animals. Epizootiology, etiology, clinical signs, diagnosis and diseases control including immunization and sanitation.
- 562-565. Clinics VII, VIII, IX, X (2-4-4-4). Lab. 11. Spring, Summer, Fall, and Winter.**
Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases of small domestic animals.
- 566-567-568-569. Clinics II, III, IV, V (2-4-4-4). Lab. 11. Spring, Summer, Fall and Winter.**
Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases of large domestic animals.
- 572-573-574. Veterinary Surgery IV, V, VI, (1-1-1). Lab. 2. Summer, Fall and Winter.**
Detailed consideration and performance of advanced small animal surgery.
- 579. Veterinary Public Health II (5). Lec. 5. Winter. Pr., VM 460.**
Principles and methodology of food hygiene including meat, milk, poultry, and other foods related to animal and human health.
- 582-583. Seminar I, II (2-1). Summer and Fall.**
Literature reviews or research problems selected by the student. Papers written and oral presentation given before his class and faculty.

592. Preceptorship (0). Spring.

Non-credit required course.

Completion of satisfactory preceptorship during the spring quarter is required for graduation.

GRADUATE COURSES

414. **Techniques in Bacteriology (5).** Pr., VM 461 or equivalent and junior standing. Any quarter by arrangement.
Advanced techniques used in bacteriology, pertaining to isolation, cultivation and identification of microorganisms. (Course limited to five students.)
418. **General Pathology (5).** Lec. 3, Lab. 4. Fall. Pr., satisfactory courses in histology and physiology.
Fundamental alterations of disease, adapted for especially qualified graduate students. (Not available for candidates for M.S. in Veterinary Medicine.)
425. **Intermediate Human Physiology (5).** Lec. 4, Lab. 2. Fall by arrangement. Pr., VM 210 or its equivalent and junior standing.
For advanced students in home economics, education and others who are qualified. A detailed study of the physiology of the various organs of the body. (Not available for candidates for M.S. in Veterinary Medicine.)
441. **Physiological Function Tests and Laboratory Diagnosis (5).** Lec. 4, Lab. 3. Any quarter by arrangement. Pr., permission of the instructor, acceptable courses in physiology, and junior standing.
Chemical, photometric, and enzymatic procedures used in diagnosis of abnormal body functions. Included are function tests for the thyroid, liver, kidney, heart, pancreas, etc.
467. **Gross Pathology (2).** Lab. 6. Pr., VM 452, junior standing and permission of instructor. Any quarter by arrangement.
Regular participation in autopsy examinations under supervision of senior staff members. Designed to give the graduate student experience in autopsy procedures and in diagnostic interpretation of gross lesions. (Required of all majors and minors in Pathology.)
470. **Histological Techniques (2 to 5).** Hours and credit to be arranged. Pr., VM 326 or equivalent and junior standing.
Techniques employed in the preparation of cytological and histological materials.
475. **Special Techniques in Histopathology (3).** Lab. 9. Pr., VM 452, VM 460. Any quarter by arrangement.
Special stains and techniques of histochemistry employed in the preparation of materials for histopathologic study.
480. **Radiological Techniques (5).** Lec. 3, Lab. 4. Any quarter by arrangement.
Radiographic techniques including assignments on basic radiation physics.
495. **Virology (5).** Lec. 2, Lab. 6. Pr., VM 330 or VM 331 or VM 461; junior standing. Spring.
Basic concepts, methods of isolation, cultivation and purification of viruses and rickettsiae. (For students in biological sciences, biochemistry, pharmacy and veterinary medicine.)
- 601-602. **Advanced Pathogenic Microbiology (5-5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., acceptable courses in microbiology and immunology.
Identification of pathogenic microorganisms and their relationship to animal diseases.
- 604-605. **Immunology (5-5).** Lec. 2, Lab. 6. Pr., VM 461 or equivalent. Spring quarter by arrangement.
Immunizing agents, methods of establishing immunity, and techniques for demonstrating various types of immunity and antigen-antibody reactions. The work may be arranged to meet the particular interest of the student.
608. **Determinative Microbiology (5).** Lec. 2, Lab. 6. Fall Quarter by arrangement. Pr., VM 300 and VM 414.
Microbial classification, identification, and concepts pertaining to international rules of nomenclature.
609. **Clinical Mycology (5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., permission of the instructor and acceptable courses in bacteriology.
Methods and techniques used in isolating and propagating yeasts, molds and actinomycetes pathogenic for animals. Laboratory diagnosis of fungus infections in animals.
610. **Microbial Physiology (5).** Lec. 2, Lab. 6. Pr., CH 418 and VM 414 or equivalent. Spring.
Biochemistry and genetics of structure and metabolism of microorganisms.
- 611-612. **Advanced Pathology (5-5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., VM 452 or equivalent.
A comprehensive study of gross and microscopic lesions of animal diseases.
615. **Oncology (5).** Lec. 1, Lab. 8. Pr., VM 465. Any quarter by arrangement.
The gross and microscopic pathology of the neoplasms of the domestic animals.
616. **Histochemistry (5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., CH 419, VM 418, VM 460 or ZY 308 or equivalent.
Evaluation and application of histochemical methods in the localization of cellular constituents.

617. **Veterinary Protozoology (5).** Lec. 3, Lab. 4. Any quarter by arrangement. Pr., VM 458 or ZY 411 or equivalent.
Detailed study of selected diseases of veterinary importance caused by protozoan parasites.
- 618-619. **Veterinary Helminthology (5-5).** Lec. 3, Lab. 4. Any quarter by arrangement. Pr., VM 457 or ZY 411 or equivalent.
Detailed study of selected diseases of veterinary importance caused by metazoan parasites.
620. **Pathology of Parasitic Diseases (5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., VM 452 and 457 or equivalent.
A detailed study of the pathology of parasitic diseases of veterinary importance.
- 621-622. **Advanced Anatomy (5-5).** Lec. 2, Lab. 9. Pr., permission of instructor. Any quarter by arrangement.
A. Cardiovascular Anatomy. B. Anatomy of the Urogenital System. C. Neuroanatomy. D. The Anatomy of the Locomotor System, and E. The Anatomy of the Special Senses.
624. **Experimental Neuroanatomy (5).** Lec. 2, Lab. 9. Pr., VM 621-622 (C) Neuroanatomy. Any quarter by arrangement.
Results of especially oriented experimental lesions of the central nervous system employing the Horsley-Clark stereotaxic instrument.
- 625-626. **Advanced Histology of Domestic Animals (5-5).** Lec. 2, Lab. 9. Any quarter by arrangement.
Special phases of the microscopic structure of animal tissues and organs.
631. **Advanced Pathological Physiology (5).** Any quarter by arrangement. Pr., CH 301 and VM 421 or their equivalent.
The physiological response of the body to disease. Diseases discussed will be those of the liver and kidney.
632. **Advanced Pathological Physiology (5).** Lec. 4, Lab. 3. Any quarter by arrangement. Pr., CH 301 and VM 421 or their equivalent.
Physiological explanation of abnormalities of the reproductive and endocrine systems.
633. **Advanced Pathological Physiology (5).** Lec. 4, Lab. 3. Any quarter by arrangement. Pr., VM 624 or its equivalent.
Abnormalities of the nervous system which lend themselves to a physiological explanation.
- 635-636. **Advanced Veterinary Pharmacology (5-5).** Lec. 3, Lab. 4. Any quarter by arrangement. Pr., VM 436, VM 437.
Pharmacology of some of the more important drugs used in veterinary medicine. In the laboratory, students will have an opportunity to determine the pharmacology of the drugs on the horse, cow, pig and dog.
638. **Physiology of Digestion (5).** Any quarter by arrangement. Pr., CH 301 and VM 421 or their equivalent.
Enzymatic and bacterial digestion as well as the motility of the gastro-intestinal tract in farm animals.
639. **Small Animal Nutrition (5).** Lec. 4, Lab. 3. Any quarter by arrangement. Pr., permission of the instructor and acceptable courses in physiology.
Requirement of amino acids, fats, carbohydrates, minerals and vitamins for dogs, cats and other small animals. Nutritional antagonists and symptoms of nutritional deficiencies in the animals.
643. **Veterinary Radiation Biology (5).** Lec. 4, Lab. 3. Any quarter by arrangement. Pr., permission of the instructor and acceptable courses in chemistry and animal physiology.
Instruments used for radiation detection, isotope techniques, and diagnostic tests used in animals, and the effects of radiation on animal tissues. Isotopes will be primarily gamma emitters.
645. **Electrocardiology and Blood Vascular Physiology (5).** Any quarter by arrangement. Pr., VM 421 or its equivalent.
Physiology of the blood vascular system and the advanced techniques used in electrocardiology.
647. **Canine Neurosurgery (5).** Lec. 2, Lab. 6. Any quarter by arrangement. Pr., permission of the instructor.
Applied anatomy, physiology, physical and radiographic diagnosis, and surgical correction of lesions (especially those of traumatic origin) affecting the nervous system of the dog.
- 651-652. **Advanced Large Animal Surgery (5-5).** Lec. 1, Lab. 8. Any quarter by arrangement.
Research in surgery. Advanced techniques for surgical procedures in domestic animals.
- 654-655. **Advanced Large Animal Medicine (5-5).** Lec. 1, Lab. 8. Any quarter by arrangement.
Special study of the causes, methods of diagnosis, treatment and methods of control and eradication of selected non-surgical diseases of domestic animals.

657. Gynecology of large domestic animals (5). Any quarter by special arrangement. Special study of functional and infectious condition affecting female reproduction.
658. Andrology of large domestic animals (5). Any quarter by arrangement. Special study of functional and infectious conditions affecting breeding sites.
660. Advanced Small Animal Surgery (5). Lec. 1, Lab. 10. Any quarter by arrangement. Techniques in general small animal surgery.
662. Advanced Small Animal Orthopedic Surgery (5). Lec. 1, Lab. 10. Any quarter by arrangement. New techniques in general orthopedic surgery.
663. Advanced Small Animal Eye Surgery (5). Lec. 1, Lab. 10. Any quarter by arrangement. New techniques in eye surgery.
- 664-665. Advanced Small Animal Medicine (5-5). Lec. 1, Lab. 10. Any quarter by arrangement. Causes, methods of diagnosis, treatment and control of non-surgical diseases of small animals.
666. Advanced Canine Neurology (5). Lec. 3, Lab. 6. Any quarter by arrangement. Etiology of diagnosis, treatment and control of neurological diseases of the dog.
667. Normal Radiological Anatomy (5). Lec. 4, Lab. 2. Any quarter by arrangement. Normal structure, size and position of the various organs as they appear on flat and contrast radiographs.
668. Advanced Radiology (5). Lec. 1, Lab. 8. Any quarter by arrangement. Advanced radiographic techniques including fluoroscopy, uses of contrast mediums, and the principles of image intensification and cineradiography.
669. Radiological Interpretations (5). Lec. 1, Lab. 8. Any quarter by arrangement. Advanced study of radiological interpretation of pathological lesions of domestic animals.
671. Small Animal Cardiovascular Surgery (5). Lec. 1, Lab. 10. Any quarter by arrangement. Application of accepted, as well as the recently developed techniques of cardiovascular surgery.
696. Seminar (0-1). Non-credit course required of all graduate students in Veterinary Medicine. Meets regularly at scheduled intervals each year during Summer Quarter.
698. Research Problems (2 to 5). (Credit to be arranged.)
699. Research and Thesis. (Credit to be arranged.)

Vocational and Adult Education (VED)

Professors Montgomery, Head, Herndon, Jarecke, and Kurth

Associate Professors R. A. Baker, and Bottoms

Assistant Professors Anderson, R. J. Baker, Couch, Eaddy, Ensminger,

Frank, Knight, G. D. Patterson, S. D. Patterson, Sankovsky,

Sink, and Williams

Instructors Burton, Dugas, Hartzog, Massey, Moates, and Sawyer

Extension Associates Brooks, Caldwell, Nadolsky, C. Parker, and Robinson

Research Associates Barnes, Drake, Morgan, and M. Parker

102. Orientation for Transfer Students (1). Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
103. Orientation for Freshmen (1). Helps freshmen in planning their professional careers.
104. Orientation to Laboratory Experiences (1).
246. Instructional Drawing (3). Lab. 6. Preparing for the shop laboratory, including making freehand and pictorial sketches and drawings, reading working drawings, blue prints, manufacturers guides, and lettering, use of instruments, dimensioning, making models, floor plans, bills for materials, writing specifications, and developing working plans.
330. Careers in Rehabilitation Services (5). History, legal basis, and fields of rehabilitation services. Exploration of specialty fields of mental retardation, mental illness, public offender, physically handicapped, speech therapy and hearing, visually handicapped, respiratory disease, alcoholic and aging.
346. Vocational and Adult Education (3). Ways of studying occupational needs and developing and operating local program of vocational and adult education.

- 400. Introduction to Power Mechanics (5). Lec. 2, Lab. 6.**
Design and operational theories related to power machines. Internal combustion engines; power trains; hydraulic and cooling systems.
- 401. Practicum in Small Gasoline Engines (5). Lec. 2, Lab. 6.**
Application of skills and abilities needed in teaching the maintenance and repair of small air cooled engines. Theories of compression, carburetion and ignition; laboratory exercises in repair and maintenance.
- 402. Automotive Construction and Repair (5). Lec. 2, Lab. 6.**
Theories of design, principles of operation, and maintenance and repair of ignition system, fuel systems, power systems and chassis components.
- 404. Practicum in General Metals (5). Lec. 2, Lab. 6.**
Application of skills and abilities needed in the teaching of metal processes applicable to vocational education program in the secondary school. Metal properties; power tools; heat treating; ornamental iron work, cold metal; sheet metal; machining metals; and arc and gas welding.
- 405. The School Shop (3).**
Organization and management of the school shop; methods and materials integrated with the study of jobs and problems basic to the teaching of skills in vocational education.
- 406. Practicum in Building Construction and Maintenance (5). Lec. 2, Lab. 6.**
Application of skills and abilities needed in teaching the erections of buildings and other related structures. Bills of materials; hand and machine woodworking; structural carpentry; plumbing; design and installation of residence wiring; heating and cooling concrete and masonry construction; painting and other related information. (A) Agricultural education majors and (B) Basic vocational education majors.
- 407. Practicum in Electricity (5). Lec. 2, Lab. 6.**
Application of skills and abilities needed in the teaching of fundamental principles of electricity. Planning and developing projects involving an understanding of electrical principles as applied to materials selection, circuits, motors and devices; and maintenance and servicing of electrical equipment and appliances.
- 409. Teaching Electronics in Industrial Arts (5). Lec. 2, Lab. 6. Pr., permission of department head.**
Theories and practices used in school electronic laboratories; projects designed and constructed.
- 411. Teaching Home Economics Education (5). Lec. 4, Lab. 2. Pr., FED 320 or equivalent.**
- 412. Program in Home Economics Education (4). Lec. 3, Lab. 2. Pr., FED 320 or equivalent.**
- 414. Program in Area of Specialization (3). Lec. 2, Lab. 2. Pr., FED 320 or equivalent.**
Program planning principles involved in designing program activities for specific areas of specialization. (A) Agricultural Education, (B) Industrial Arts Education, (C) Trade and Industrial Education, (D) Distributive Education, (E) Rehabilitation, (F) Adult Education, (G) Technical Education, and (H) Business.
- 415. Teaching in Area of Specialization (3-5). Lec. 2, Lab. 2. Pr., FED 320 or equivalent.**
Understanding of curriculum content; methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for specific area of specialization. (A) Agricultural Education, (B) Industrial Arts Education, (C) Trade and Industrial Education, (D) Distributive Education, (E) Rehabilitation, (F) Adult Education, (G) Technical Education, and (H) Business.
- 423. Program in Basic Vocational Education (3). Lec. 2, Lab. 2. Pr., FED 320 or equivalent.**
(A) Agriculture, (B) Building Construction, (C) Distributive Business, (D) Metals Technology, and (E) Power Mechanics.

Undergraduate students with a major in industrial arts will pursue a minor selected from some other teaching area in the secondary school program or in one of the areas included in the twelve-grade program. (For appropriate course or courses in Teaching or Program, see SED, IED, and HPR.)

- 425. Professional Internship in Vocational and Adult Education (15). Pr., Sr. standing, Admission to Teacher Education prior to Internship, minimum of two appropriate Teaching and Program Courses.**
(For description, see Professional Internship in School of Education section.)
A directed practicum to provide opportunities for students to develop needed competencies in areas of specialization through observation and practice with on-going programs in selected centers. (A) Agricultural Education, (B) Industrial Arts Education, (C) Trade and Industrial Education, (D) Distributive Education, (E) Rehabilitation, (F) Adult Education, (G) Technical Education, (H) Business, and (I) Home Economics.

458. **Coordination and Supervision of Vocational Education Programs (3). Lec. 2, Lab. 2.**
Develops and maintains appropriate relationship between the school and on-the-job program; records of coordination; student placement; improving employable skills and habits; recruitment and selection of work experience applicants; work experience rotation; public information and other similar activities.
459. **Independent Studies in Area of Specialization (1-10). May be repeated for a maximum of 10 hours. Pr., permission of instructor.**
Designed to enable students to pursue topics of special interest in depth in various areas of specialization.
462. **Directed Work Experience in Distributive Education (5). Lab. 10. Pr., VED 414.**
In-service, supervised work experience. Individually designed for part-time and/or summer experience.
466. **Teaching Out-of-School Groups (3). Pr., VED 414.**
Conducting surveys, occupational analysis, using advisory committees, organizing, conducting and supervising various types of adult education.
- 475-480. **Trade and Technical Experience (5-5-5-5-5).**
An experience completed by supervised employment or by examination on basis of journey-man level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to starting the curriculum. elective coursework may be substituted for these credits.

Advanced Undergraduate and Graduate

408. **Teaching Mechanical Technology (5).**
Objectives and methods; equipment and management of vocational education shops; organization of projects; recent developments in specialized areas of mechanics; in-service teaching problems. Student plans for demonstration of methods for teaching mechanical skills.
410. **Occupational Information (3). Lec. 2, Lab. 2. Pr., junior standing, FED 320 or equivalent.**
Occupational structure, job qualifications and requirements, sources of occupational information, current trends, industrial and occupational surveys. Preparation, evaluation, and dissemination of occupational information used by teachers in vocational and technical schools.
413. **Nature of Adult Education (5). Pr., junior standing.**
The characteristics of adults as learners and the history, philosophy, and nature of adult education; applied to specific adult groups in developing and implementing adult educational programs in basic, occupational or continuing education. History and principles of adult education as applied to the development and implementation of programs in remedial, occupational and continuing education.
430. **Evaluation and Training in Vocational Rehabilitation (4). Lec. 3 hours daily for 6 weeks, internship 4 weeks. Pr., permission of department head and junior standing.**
Purposes, principles and techniques of client evaluation and training; including personal, social and physical adjustment, vocational choice and selected techniques used in the evaluation and training process.
431. **Research in Evaluation and Training in Vocational Rehabilitation (4). Lec. 3 hours daily for 6 weeks, internship 4 weeks. Pr., permission of department head and junior standing.**
Study of a problem using research techniques; to be selected in consultation with the supervising professor.
432. **The Instructional Program in Workshop and Rehabilitation Facilities (3). Lec. 3 hours daily for 4 weeks, internship 6 weeks. Pr., permission of department head and junior standing.**
Includes program development, teaching, learning, resources, evaluation, project development and production, and supervision.
433. **Management of Vocational Rehabilitation Workshops and Facilities (3). Lec. 3 hours daily for 4 weeks, internship 6 weeks. Pr., permission of department head and junior standing.**
The function of organization and administration including: federal, state, and local roles, financial support, community interaction, personnel management, and operation of facilities.
434. **Work Sample Development (5). Pr., VED 330 and junior standing.**
Development of methods of selection, standardization, and establishing norms for work samples used in vocational evaluation units.
435. **Vocational Evaluation (5). Pr., junior standing.**
Evaluation techniques used in appraisal of the abilities of people to guide occupational choice. Includes use of TOWER system, work samples, on-the-job training, personal adjustment.

- 437. Vocational Training and Occupational Orientation of the Mentally Retarded (5). Pr., junior standing.**
Principles for providing occupational orientation and work experience; techniques of curriculum planning, job classification and evaluation, selection, and placement; curricular activities related to work experience; community agencies and public relations.
- 441. Development of Vocational Education (4).**
Historical perspective of the development of vocational education with an overview of its nature and purpose relative to the technological society.
- 456. Learning Resources in Area of Specialization (4). Pr., FED 320 or equivalent.**
(A) Agricultural Education, (B) Industrial Arts Education, (C) Trade and Industrial Education, (D) Distributive Education, (E) Rehabilitation, (F) Adult Education, and (G) Technical Education.
- 474. Organization of Instruction in Vocational-Technical Education (5). Pr., junior standing.**
Trade and occupational analysis; principles and procedures of identifying and selecting the skills and knowledge needed in the preparation of courses of instruction. Principles and procedures for individualizing instruction.
- 491. Problems in Teaching the Disadvantaged Adult (3-5). Pr., junior standing.**
The disadvantaged adult with special emphasis on the unique sociological, psychological and physiological factors that influence learning and participation in remedial learning activities.
- 602. Teacher Education in Vocational and Adult Education (5).**
Designed for supervisors of student teachers, teacher educators, and other graduate students. Major emphases deal with administration of vocational education programs, research, problems which supervising teachers encounter in the student teaching program.
- 603. Problems in Agricultural Occupations (5).**
Securing, organizing and interpreting information for guidance and teaching purposes; curriculum development; developing instruction units and planning teaching activities for on-farm and off-farm occupations.
- 606. Organization and Utilization of Community Resources (5).**
Processes through which new ideas and innovations are utilized through community organization to maximize the effective use of physical and human resources.
- 608. Administration of Vocational and Practical Arts Education (5).**
Prepares professional personnel for leadership positions and to relate current social demands to vocationally oriented programs. Content includes philosophy and an application of procedures in administering and supervising new and on-going programs to meet changing socio-economic conditions.
- 625. Internship in Vocational and Adult Education (5-10).**
A directed practicum in agency centers or programs whereby the graduate student develops administrative and programming competencies by translating theory into practice, testing principles and evaluating on-going activities.
- 646. Studies in Education (1-3). Pr., one quarter of graduate study. May be repeated for credit not to exceed 3 hours. Apply to one of the following areas of Vocational and Adult Education Program.**
(A) Agriculture, (B) Industrial Arts, (C) Trade and Industrial, (D) Distributive, (E) Rehabilitation, (F) Adult, (G) Technical, (H) Business, (I) Home Economics.
- 650. Seminar in Areas of Vocational and Adult Education (1-3), may be repeated for credit not to exceed 3 hours.**
Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
- 651. Research Studies in Vocational and Adult Education (5).**
Review, analysis and interpretation of available research with emphasis on designing new research directed toward meeting the changing educational needs of individuals pursuing educational goals not requiring a baccalaureate degree.
- 652. Curriculum and Teaching in Vocational and Adult Education (5).**
Teaching practices and reappraisal of selecting experiences, methods, materials, and content for curriculum improvement in social adjustment, occupational adjustment and occupational training programs.
- 653. Organization of Program in Vocational and Adult Education (2-5).**
Advanced Course. Program, organization and development of basic and supplementary materials for guiding educators and educational systems in the continuous improvement of curriculum and learning practices.
- 654. Evaluation of Programs in Vocational and Adult Education (5).**
Evaluation and investigation of teaching effectiveness in social adjustment, occupational adjustment and occupational training with attention also given to the utilization of human and material resources and the coordination of the total school program with other educational programs in the community.

659. **Practicum in Areas of Specialization (1-10).** (May be repeated for credit not to exceed 10 hours.)
The practicum provides graduate students with supervised experiences in various work settings with emphasis on the application of concepts, principles and skills acquired in previous course work.
699. **Thesis Research.** Credit to be arranged. May be taken more than one quarter.
798. **Field Project.** Credit to be arranged. May be taken more than one quarter.
799. **Doctoral Research and Dissertation.** Credit to be arranged. May be taken more than one quarter.

Zoology-Entomology (ZY)

Professors Arant, *Head*, Bass, Berger, Blake, Dendy, Dusi, Hays, and Ottis
Associate Professors Cunningham, Dixon, Gilliland, Hyché, Ivey, Mount,
Ramsey, Speake, and Watson
Assistant Professors Causey, Dobie, Estes, Folkerts, Harper, Kennamer,
Kouskolekas, Lawrence, Lisano, Mason, Pullen, Valcovic, and Wilson
Instructor Cook
Research Lecturers Davis, Frandsen, and Porter

100. **Zoological Orientation (0).** Lec. 1. Fall.
Historical and current concepts embodied in various disciplines of the zoological sciences.
204. **Insects (3).** General elective.
Life processes, occurrence, and importance of insects. (May not be taken for credit by students who have already earned credit in a more advanced course in entomology.)
205. **Wildlife Conservation (3).** Fall. General elective.
Conservation and natural history of important wildlife animals, especially Alabama fish, amphibians, reptiles, birds, mammals. Some field trips may be required, as substitute for part of the scheduled lectures. (May not be taken for credit by students who have already earned credit in more advanced wildlife courses.)
206. **Conservation in the United States (3).** Winter, Spring, Summer. General elective.
Basic facts essential to an understanding of current problems pertaining to the conservation of our rapidly depleting natural resources such as soil, water, minerals, forest, and wildlife. Especially planned for elementary and high school teachers.
207. **Birds (3).** Lec. 3. Fall, Summer. General elective.
Birds in relation to agriculture and game management, recognition of various species as to flight, color markings, songs, and feeding habits. (May not be taken for credit by students who have already earned credit in ZY 422.)
208. **Biological Issues in Human Ecology (3).** Lec. 3. All quarters.
An investigation into the origin, nature, and growth of human populations, emphasizing the role of man in past, present, and future ecosystems. Degree credit may not be earned in both ZY 208 and BI 104.
214. **Vertebrate Physiology and Anatomy (5).** Lec. 4, Lab. 3. Fall, Winter. Pr., BI 103.
Function and structure of the organ systems of the vertebrate. Aimed primarily to fill the needs of students in the School of Education. Cannot be used as a prerequisite to ZY 424.
300. **Genetics (5).** Lec. 4, Lab. 2. All quarters. Pr., BI 102 or 103 and college algebra or equivalent.
Basic genetic principles, theoretical basis for genetic systems, and modern areas of research. Laboratory work emphasizes experiments with the fly, *Drosophila*.
301. **Comparative Anatomy (5).** Lec. 3, Lab. 6. All quarters. Pr., BI 103.
Comparisons of the systems of the vertebrates.
302. **Vertebrate Embryology (5).** Lec. 3, Lab. 6. Fall, Winter, Spring. Pr., BI 103.
Consideration of the details of fertilization, cleavage, morphogenesis, and organogenesis of the amphioxus, frog, chick, pig, and human from a descriptive and analytical viewpoint. Laboratory work will consist of prepared material supplemented with available living material.
303. **Principles of Evolution and Systematics (5).** Lec. 5. Fall, Winter, Spring. Pr., BI 102 or 103.
The major processes, methods, and philosophic basis for present-day concepts of evolution and systematics.
304. **General Entomology (5).** Lec. 4, Lab. 3. Fall, Spring, Summer. Pr., BI 103.
General characteristics and habits of the orders and families of the Class Insects.
305. **Forest Entomology (3).** Lec. 2, Lab. 3. Spring. Pr., BI 103.
Principles of entomology in relation to insects of forests and forest products; recognition, life histories, and control of major insects of forests.

306. **General Animal Ecology (5).** Lec. 4, Lab. 3. Fall, Spring. Pr., 10 hours of biology or permission of instructor.
The physical and biotic environments and the interactions of these factors with animals. The organization and functions of communities and populations.
308. **Micrology (5).** Lec. 3, Lab. 6. Fall, Winter, Spring. Pr., BI 103.
Basic processes and principles of micrology. Laboratory methods of fixation, embedding, sectioning, coloring, and mounting of tissues of vertebrate and invertebrate animals.
310. **Cell Biology (5).** Lec. 4, Lab. 3. All quarters. Pr., 10 hours of General Biology.
Morphology and physiology of cell membranes, cytoplasm, and the formed elements of the cytoplasm and nucleus. Cell division, molecular transport, cellular homeostasis, and biochemical pathways of energy production.
326. **Wildlife Biology (5).** Lec. 3, Lab. 6. Winter. Pr., a course in ecology.
Basic principles of the ecology of wildlife populations and their relations to natural habitat. Laboratory work will consist of practical exercises designed to acquaint the student with modern methodology and technique in studying wild bird and mammal populations.
401. **Invertebrate Zoology (5).** Lec. 3, Lab. 6. Fall, Winter, Summer. Pr., BI 103 and junior standing.
Biology, taxonomy, and ecology of invertebrate animals.
402. **Economic Entomology (5).** Lec. 4, Lab. 3. Fall, Spring, Summer. Pr., junior standing.
Consideration of the biological aspects, life histories, and control of insects.
404. **Medical Entomology (5).** Lec. 4, Lab. 3. Spring. Pr., ZY 304 and junior standing.
Insects, mites, and ticks of parasitological or medical importance to man. Emphasis placed on the role of arthropods in transmission of protozoan and other diseases and prevention of these diseases by controlling their arthropod vectors.
405. **Forest Insects (5).** Lec. 4, Lab. 3. Fall. Pr., ZY 304, 305, or 402 and junior standing.
Principal insects of forests and forest products; their importance, taxonomy, bionomics, and control. Emphasis will be placed on life histories and habits. Identification by morphological characteristics and type of damage, and control by chemical, biological, and cultural or forest-management practices.
406. **Bee Culture (3).** Lec. 2, Lab. 3. Spring. Pr., BI 103 and junior standing.
Manipulation and production of bees and honey, and a consideration of bee diseases.
407. **General Insect Morphology (5).** Lec. Lab. 6. Spring. Pr., ZY 304 and junior standing.
Comparative external anatomy and generalized internal structures of insects; characteristics used in taxonomy will be emphasized.
409. **Histology (5)** Lec. 3, Lab. 6. Winter, Spring, Summer. Pr., BI 103 and junior standing.
Morphology, histogenesis, regeneration and repair, and classification of tissues; arrangement of tissues in organs and systems of vertebrate animals.
410. **Systematic Entomology (5).** Lec. 2, Lab. 6. Winter. Pr., ZY 304 and junior standing.
Principles of systematics and identification of insects through orders, families, genera, and species.
411. **General Parasitology (5).** Lec. 3, Lab. 6. All quarters. Pr., BI 103 and junior standing.
Origin, adaptations, physiology, and ecology of parasites. Identification and life histories of representative parasitic protozoa, helminths, and arthropods with emphasis on host-parasite relationships. Techniques of examining animals for the presence of parasites and the proper preparation of such collections for study.
415. **Limnology (5).** Lec. 3, Lab. 6. Spring. Pr., CH 104, PS 205, BI 103 and junior standing.
Biological, chemical, and physical factors affecting aquatic life.
- 418-19. **Experimental Heredity (3-3).** Lec. 1, Lab. 4. Fall, Winter. Pr., ZY 300 and junior standing.
A two-quarter sequence in advanced experimental methods in genetics. Research problems utilizing various laboratory organisms will extend throughout the two quarters.
420. **Human Heredity (5).** Lec. 5. Spring. Pr., ZY 300, CH 208, and junior standing.
Effects and normal and abnormal chromosome complements, the biological interaction of genes, and the effects of mutation and changes in gene frequency on human populations; problems in small sample analyses, biochemical screening of human "carriers," and the prospects for genetic engineering.
421. **Vertebrate Zoology I (5).** Lec. 3, Lab. 6. Fall, Spring, Summer. Pr., BI 103 and junior standing.
Taxonomy, ecology, and evolution of fishes, amphibians, and reptiles.
422. **Vertebrate Zoology II (5).** Lec. 3, Lab. 6. Fall, Summer. Pr., BI 103 and junior standing.
Basic taxonomy, ecology, evolution, and some biological principles of birds and mammals. Laboratory studies in radio-telemetry, bioacoustics, and population dynamics are used in addition to classical vertebrate zoology exercises.

424. **Animal Physiology (5).** Lec. 4, Lab. 3. Fall, Winter, Spring. Pr., Biochemistry or ZY 310, CH 208, and junior standing.
Systematic study of the physiology of the nervous system, special senses, circulation, respiration, digestion, kidney function, hormonal control, and reproduction. An effort is made to acquaint the student with methods of experimentation as a means for the direct acquisition of physiological facts.
425. **Forest Wildlife Management (3).** Lec. 3. Winter. Pr., FY 420 or permission of instructor.
Principles of wildlife management as applied to forest properties. Restricted to students in forestry.
426. **Principles of Game Management (5).** Lec. 4, Lab. 3. Fall, Spring. Pr., ZY 326 and junior standing.
Fundamentals of game management theory, application, and administration.
427. **Wildlife Habitat Analysis (3).** Lec. 1, Lab. 6. Summer. Pr., ZY 426, BY 406, and junior standing.
Practical exercises in vegetation analysis, utilization studies, aerial photograph interpretation, and cover type mapping.
429. **Quantitative Genetics (5).** Lec. 4, Lab. 3. Pr., ZY 300, BY 401 or permission of instructor.
The theory of Mendelian inheritance extended to properties of populations dependent on segregation of genes at many loci.
435. **Marine Biology (3).** Fall. Pr., acceptable chemistry background, BI 103 or equivalent, and junior standing.
Introduction to the physical, chemical, and biological characteristics of the marine environment.
438. **General Ichthyology (5).** Lec. 3, Lab. 6. Fall. Pr., BI 103 and junior standing.
Morphological, functional, geographical, and behavioral survey of fishes. Classification of fishes using monographs and keys. Field trips and laboratory work will emphasize local species.
439. **Aquatic Communities (5).** Lec. 2, Lab. 9. Summer. Pr., BI 102-3 and junior standing.
Environmental relations of the biota of freshwater habitats.
440. **Physical Marine Geology (4½).** Lec. 2, Lab. 5. Summer only. Pr., physical and historical geology, mineralogy, and junior standing.
General introduction to the physical processes on the shores of Mississippi Sound, emphasizing the erosional and depositional effects of waves and currents. Beaches and spits periodically surveyed to measure changes in shape, height, cross-section, lateral shift, and particle distribution and to observe growth and destruction of bars, cusps, spits and tide-pools. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
441. **Chemical Marine Geology (4½).** Lec. 2, Lab. 5. Summer only. Pr., physical and historical geology, mineralogy, CH 105 and CH 206, and junior standing.
Supervised research in the chemistry of the waters of Mississippi Sound and geochemistry of the bottoms. Lateral, vertical and tidal changes in water composition. Analyses of core samples taken from different environments: bayous, mudflats, bars, oyster reefs, bays, tidal channels and sandy shelves. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
443. **Marine Vertebrate Zoology and Ichthyology (9).** Lec. 5, Lab. 12. Summer only. Pr., 18 hours of biology including BI 103 and junior standing.
A general study of the marine chordata, including lower groups and the mammals and birds, with most emphasis on the fishes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
444. **Marine Fisheries Biology (6).** Lec. 3, Lab. 9. Summer only. Pr., 25 hours of zoology including ZY 421, and junior standing.
Survey of the principles of the subject beginning with a study of fishery landing statistics of the United States followed by other areas of the earth. The classic theory will be examined and statistical applications will be made to various Gulf of Mexico fisheries. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
445. **Marine Invertebrate Zoology I (9).** Lec. 5, Lab. 12. Summer, even years. Pr., 18 hours of biology including BI 103 and ZY 401, and junior standing.
A concentrated study of morphology, life histories, distributions, and phylogenetic relationships of marine phyla: protozoans through lophophorates. Laboratory and field work included. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
446. **Marine Invertebrate Zoology II (9).** Lec. 5, Lab. 12. Summer, odd years. Pr., 18 hours of biology including BI 103 and ZY 401, and junior standing.
A concentrated study of morphology, life histories, distributions, and phylogenetic relationships of marine phyla: mollusks through protochordates. Laboratory and field work included. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
450. **Zoogeography of the Vertebrates (5).** Lec. 4, Lab. 3. Winter, even years. Pr., ZY 421 or permission of instructor and junior standing.
The principles of geographic distribution of vertebrate animals.

498. Special Problems (1-3). Pr., senior standing.

A. Zoology; B. Entomology; C. Wildlife Management. A student can register for a total of not more than three hours credit.

GRADUATE COURSES**601. Insect Morphology (3). Lec. 1, Lab. 6. Fall. Pr., ZY 407.**

Detailed studies of the internal structures of insects.

602. Advanced Insect Taxonomy (5). Lec. 1, Lab. 8. Summer, odd years. Pr., ZY 410.

Principles of systematics including phylogeny with emphasis on a particular group of insects which the student may choose.

603. Insect Physiology (5). Lec. 3, Lab. 6. Spring, even years. Pr., ZY 424 and ZY 601.

General and comparative physiology of the organ systems of insects. A minimum of two literature reviews will be made by each student during the quarter.

604. Insect Toxicology (5). Lec. 4, Lab. 3. Winter.

Toxic action of insecticides; analysis, preparation and use of insecticides; spray residues in relation to health; research methods in insect toxicology.

605. Ornithology (5). Lec. 3, Lab. 6. Spring. Pr., ZY 422.

Ecology and behavior of birds.

606. Mammalogy (5). Lec. 3, Lab. 6. Winter. Pr., ZY 422.

Taxonomy, ecology, and behavior of mammals.

607. Farm Game Management (5). Lec. 3, Lab. 6. Fall. Pr., ZY 426.

For graduate students majoring in Game Management or Fisheries Management. Application of game management theories, techniques, and administration with special emphasis on farm game species.

608. Forest and Range Game Management (5). Lec. 3, Lab. 6. Winter. Pr., ZY 426.

For graduate students majoring in Game Management or Fisheries Management. Application of game management theories, techniques, and administration with special reference to forest and range game.

609. Advanced Applied Entomology (5). Lec. 4, Lab. 3. Spring. Pr., ZY 402.

Integrated control of the principal insects by environmental, biological, genetic, chemical, and legal means.

610. Immature Forms of Insects (5). Lec. 2, Lab. 6. Winter. Pr., ZY 410.

Structure and identification of immature forms of insects; methods of collecting and preserving; development and use of keys for classifying immature insects.

611. Advanced Insect Morphology and Embryology (3). Lec. 1, Lab. 6. Winter. Pr., ZY 601.

Insect morphology in relation to comparative embryological developments of insects.

612. Advanced Insect Toxicology (5). Lec. 4, Lab. 3. Spring, odd years. Pr., ZY 604.

Mode of action, mode of entry, relation of chemical structure to toxicity, and precision methods of determination of insecticides; recent developments in the field of insecticide chemistry.

613. Insect Pathology (5). Lec. 3, Lab. 4. Fall. Pr., BY 300, ZY 402, and consent of instructor.

The microorganisms associated with diseases in insects and their pathological effects on insects and insect populations.

616. Ichthyology (3). Lec. 3. Winter. Pr., ZY 438 or permission of instructor.

Fishes of the world, emphasizing morphology, distribution, and life history. Review of world literature on fish systematics.

619. Comparative Invertebrate Physiology (5). Lec. 4, Lab. 3. Spring, even years. Pr., ZY 401 and permission of instructor.

The physiological mechanisms of invertebrates with special emphasis on respiration, excretion, reproduction, locomotion, nutrition, circulation, and behavior.

622. History and Literature of Zoology (4). Lec. 3, Lab. 3. Winter. Pr., graduate standing.

A historical review of the classical authors and great works in zoological literature. Laboratory will concentrate on examining and learning to use journals, abstracts, and reference materials in the library.

623. Organic Evolution (5). Fall. Pr., ZY 430 or ZY 300.

Evolutionary principles as illustrated by the various biological disciplines, particularly genetics, paleontology, zoogeography, and systematics in general.

627. Immunology and Physiology of Parasites (5). Lec. 3, Lab. 6. Winter, even years. Pr., ZY 411, BY 300, ZY 424, and consent of instructor.

Immunity mechanisms to infections of protozoan and helminth parasites. Chemical physiology of host-parasite relationship to include nutrition, metabolism, toxicity, and chemotherapy.

629. Advanced Quantitative Genetics (5). Lec. 4, Lab. 2. Pr., ZY 429 or equivalent.

Principles of quantitative genetics applied to breeding, emphasizing difficulties encountered in commercial breeding programs.

630. Advanced Genetics (5). Winter. Pr., ZY 300 and BY 401.

Non-Mendelian hereditary systems; regulation of gene action as it influences growth, differentiation, and development; the use of statistics as an investigational tool; and the status of contemporary genetic research.

631. **Biochemical Genetics (3).** Spring. Pr., ZY 300, Coreq., CH 419.
Advanced studies of gene action on the biochemical level pertaining to metabolism, differentiation, immuno-genetics, and mutagenesis. Emphasis on current research in both prokaryotic and eukaryotic systems.
632. **Helminthology (5).** Lec. 3, Lab. 6. Spring. Pr., ZY 411.
Advanced studies of the morphology, physiology, life cycles, and host-parasite relationships of helminths. Opportunity for making extensive literature studies and collections of the parasites of a particular group of animals in which the student is most interested.
634. **Protozoology (5).** Lec. 3, Lab. 6. Winter, odd years. Pr., ZY 411.
Free-living and parasitic protozoa important to agriculture, wildlife, and man. Morphology, physiology, reproduction, ecology, and life histories of parasitic forms will be emphasized.
635. **Furbearer and Waterfowl Management (5).** Lec. 3, Lab. 6. Winter. Pr., ZY 426.
For graduate students with a major or minor in wildlife management. A study of furbearer and waterfowl resources. Emphasis is placed on problems of management and utilization.
636. **Ecology and Animal Populations (3).** Fall. Pr., ZY 306.
An investigation of the balance of nature, population cycles, natural regulation of animal numbers, competition, epizootics, and the compensatory adjustments of populations to changes in the environment.
637. **Herpetology (5).** Lec. 1, Lab. 8. Spring. Pr., ZY 421.
A study of the morphology, taxonomy, ecology, and behavior of amphibians and reptiles. Laboratory collecting, preserving, and identification of local specimens will be an important consideration.
640. **Nematology (3).** Lec. 2, Lab. 3. Spring. Pr., ZY 401 or 411.
Study and identification of the free-living soil- and aquatic nematodes and of the insect-parasitic nematodes. Detailed consideration of aspects of nematode morphology, reproduction, development, behavior, physiology, and ecology.
644. **Physiology of the Cell (3).** Fall. Pr., ZY 310 and ZY 424.
Examination of the basic physiological processes at the cellular level with the tools and approaches of physical science.
645. **Neurobiology (5).** Lec. 3, Lab. 6. Winter. Pr., ZY 424.
Morphology, physiology, and evolution of the central, autonomic, and neurohormonal systems of the vertebrate.
646. **Renal and Digestive Physiology (5).** Lec. 4, Lab. 3. Fall. Pr., ZY 424.
A comprehensive study of renal and digestive mechanisms for the qualified student in animal physiology.
647. **Endocrinology (5).** Spring. Pr., ZY 424 and AH 419.
A comprehensive treatment of the classical and modern literature of endocrinology for the qualified student in animal biology.
648. **Experimental Endocrinology (5).** Spring. Pr., ZY 647 or taken concurrently.
Laboratory studies of endocrine control mechanisms utilizing surgical, bioassay, biochemical assay, histochemical, and autoradiographic methods and techniques.
693. **Seminar.** (Credit to be arranged.)
697. **Problems in Marine Zoology (4-9).** All year. Pr., ZY 442-3.
Supervised research on specific problems in marine zoology for graduates. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
698. **Special Problems (2-5).** All quarters.
A. Zoology; B. Entomology; C. Apiculture; D. Parasitology; E. Physiology; F. Wildlife.
699. **Research and Thesis.** (Credit to be arranged.)
799. **Doctoral Research and Dissertation.** (Credit to be arranged.)

Faculty and Staff

1972-73

(The parenthetical designation after a faculty member's title indicates his department, except in the School of Pharmacy which contains no formal departments. The first date after the title indicates the year of first appointment to any position in the institution; the second, the year of appointment to present rank.)

GENERAL ADMINISTRATIVE OFFICERS

- PHILPOTT, HARRY M. *President*, 1965
A.B., Washington and Lee University; Ph.D., Yale University; D.D. (Hon.), Stetson University; LL.D. (Hon.), Washington and Lee University; LL.D. (Hon.) University of Florida; LL.D. (Hon.), University of Alabama.
- BAILEY, WILFORD S. *Vice President for Academic and Administrative Affairs*, 1942, 1966
D.V.M., M.S., Auburn University; Sc.D., Johns Hopkins University.
- LANHAM, BEN T., JR. *Vice President for Research*, 1939, 1966
B.S., Clemson University; M.S., University of Tennessee; Ph.D., Michigan State University.
- ROBERTSON, FRED R. *Vice President for Extension*, 1959, 1966
B.S., M.S., University of Tennessee; Dr.P.A., Harvard University.
- VALLERY, H. F. *Assistant to the President*, 1950, 1960
B.A., M.A., Louisiana State University; M.A.; Ed.D., Columbia University.
- BARNES, BENJAMIN P. *Director of Computer Center and Associate Professor (Electrical Engineering)*, 1970
B.E.E., Auburn University; M.S.E.E., University of Alabama; Ph.D., Auburn University.
- *BEARD, G. W. *Director of Athletics*, 1937, 1951
B.S., Auburn University.
- CANTRELL, CLYDE H. *Professor and Director of Libraries*, 1944, 1959
A.B., A.B.L.S., M.A., University of North Carolina; Ph.D., University of Illinois.
- CATER, KATHARINE C. *Dean of Women and Social Director*, 1946
A.B., Limestone College; M.A., Mercer University; M.S., Syracuse University; Litt.D., Limestone College.
- DODGE, ENCEL H. *Director of Contract and Grant Development*, 1968
B.S., Purdue University; M.S., Washington University.
- FOY, JAMES E. *Dean of Student Affairs, and Associate Professor (Counselor Education)*, 1950, 1960
A.B., M.A., University of Alabama; Ph.D., Michigan State University.
- FUNGCHES, LINWOOD E. *Director of Buildings and Grounds*, 1957
B.S., Auburn University; M.S., Cornell University.
- GUERIN, WILLIAM H. *Campus Planner and Architect*, 1967
B.Arch., University of Florida.
- HAYLEY, LEE *Director of Athletics*, 1972
B.S., M.S., Auburn University.
- INGRAM, W. TRAVIS *Business Manager and Treasurer*, 1925, 1958
- LITTLETON, TAYLOR D. *Dean, Undergraduate Studies and Professor (English)*, 1957, 1969
B.S., M.A., Ph.D., Florida State University.
- PARKS, PAUL F. *Dean of The Graduate School and Associate Professor, (Animal & Dairy Sciences)*, 1965, 1972
B.S., M.S., Auburn University, Ph.D., Texas A&M University
- SARVER, JOSEPH B. *Executive Secretary of Alumni Association, Director of Auburn Development Program*, 1951, 1960
B.S., Auburn University.
- TINCHER, WILBUR A., JR. *Director of Educational Services and Professor (Educational Administration)*, 1958, 1966
A.B., M.A., Ed.D., University of Kentucky.
- WARMAN, JAMES C. *Director of Water Resources Research Institute, and Associate Professor (Civil Engineering)* 1965, 1970
A.B., M.S., West Virginia University.

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- WEGENER, EDWARD P. _____ *Director of Educational Television*, 1954
B.S., University of Minnesota.
- WHITE, J. HERBERT _____ *Director of University Relations*, 1960, 1965
B.S., Auburn University.
- WHITE, LOUIS EDWARD _____ *Conference Director*, 1962, 1969
B.S., Auburn University; M.S., University of Alabama; Ed.D., North Carolina State University.

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- SMITH, E. V. _____ *Dean of School of Agriculture and Director of
Agricultural Experiment Station*, 1929, 1951
B.S., Auburn University; M.S., Ph.D., Iowa State University.
- McPHEETERS, E. KEITH _____ *Dean of School of Architecture and Fine Arts
and Professor (Architecture)*, 1969
B.Arch., Oklahoma State University; M.F.A. in Architecture, Princeton University.
- HOBBS, EDWARD H. _____ *Dean of School of Arts and Sciences and
Professor (Political Science)*, 1967
A.B., University of North Carolina; M.A., University of Alabama; Ph.D., Harvard University.
- TURNER, OTHEL D. _____ *Dean of School of Business*, 1968
B.A., University of Tulsa, LL.B., University of Arkansas; M.B.A., Ph.D., University of Texas.
- PIERCE, TRUMAN M. _____ *Dean of School of Education*, 1955
Ph.B., Piedmont College; M.A., University of Alabama; Ph.D., Columbia University.
- COX, J. GRADY _____ *Dean of School of Engineering, Director of Engineering
Experiment Station, Engineering Extension Service
and Professor (Industrial Engineering)*, 1949, 1970
B.S., M.S., Auburn University; Ph.D., Purdue University.
- COMPTON, NORMA H. _____ *Dean of School of Home Economics and
Professor (Consumer Affairs)*, 1968
A.B., George Washington University; M.S., Ph.D., University of Maryland.
- COKER, SAMUEL T. _____ *Dean of School of Pharmacy*, 1959
B.S., Auburn University; M.S., Ph.D., Purdue University.
- GREENE, JAMES E. _____ *Dean of School of Veterinary Medicine*, 1937, 1958
D.V.M., M.S., Auburn University.
- ABNEY, LOUIS O. _____ *Professor (Art)*, 1950, 1967
B.A., Art, M.A., Art, Auburn University.
- ACHEE, NICHOLAS, JR. _____ *Associate Professor, Head, Science-Technology
Division (Library)*, 1968
B.A., M.A., M.S.L.S., Louisiana State University.
- ADAMS, CHRISTINE A. _____ *Instructor (Secondary Education)*, 1969
B.S., Auburn University; M.A., University of Alabama.
- ADAMS, CLEVELAND L. _____ *Professor and Head (Textile Engineering)*, 1952
B.T.E., Auburn University.
- ADAMS, FRED _____ *Professor (Agronomy & Soils)*, 1955, 1965
B.S., M.S., Louisiana State University; Ph.D., University of California.
- ADAMS, GWENDOLYN J. _____ *Instructor (Elementary Education)*, 1969
B.A., Birmingham Southern College; M.A., Syracuse University.
- ADAMS, JACQUELYNN N. _____ *Extension Associate (Field Services)*, 1969, 1970
A.B., LaGrange College; M.Ed., Auburn University.
- ADAMS, JAMES W. _____ *Associate Professor (Marketing & Transportation)*, 1969
B.B.A., M.B.A., D.B.A., Georgia State University.
- ADAMS, JIMMIE V. _____ *Assistant Professor (Aerospace Studies)*, 1970
B.S., Auburn University; M.S., University of Texas; Major, United States Air Force.
- ADAMS, JORDAN E., III _____ *Assistant Professor (Aerospace Studies)*, 1969
B.A., University of North Carolina; Major, United States Air Force.
- ADAMS, MURRAY, JR. _____ *Assistant Professor (Sociology)*, 1964, 1970
B.A., M.A., University of Mississippi; Ph.D., University of Kentucky.
- AKALIN, TEKIN _____ *Visiting Professor (Architecture)*, 1969
M. of Arch., Fine Arts Academy, Istanbul, Turkey.
- ALBAN, EDWARD _____ *Instructor (Economics & Geography)*, 1969
A.B., University of Georgia.
- ALBERT, R. A., JR. _____ *Assistant Professor (Small Animal Surgery
& Medicine)*, 1962, 1966
D.V.M., M.S., Auburn University.

- ALBRITTON, WILLIAM P., JR. _____ *Assistant Professor (Electrical Engineering)*, 1971
B.S.E.E., M.S., Auburn University; Ph.D., University of Tennessee.
- ALEXANDER, HERMAN D. _____ *Associate Professor (Physiology, & Pharmacology)*, 1950, 1966
B.S., M.S., Ph.D., Auburn University.
- ALEXANDER, MILTON J. _____ *Associate Professor (Management)*, 1968
B.S., University of Illinois; M.B.A., St. Louis University; D.B.A., Georgia State University.
- ALFORD, WILLIAM L. _____ *Professor (Physics)*, 1952, 1964
A.B., Vanderbilt University; M.S., Ph.D., California Institute of Technology.
- ALLEN, CONRAD M. _____ *Associate Professor (Counselor Education)*, 1969
B.S., University of Alabama; M.A., University of Houston; Ph.D., University of Southern Mississippi.
- ALLEN, ELIZABETH G. _____ *Assistant Professor (Elementary Education)*, 1969
B.A., University of Alabama; M.Ed., Ph.D., University of Southern Mississippi.
- ALLEN, JAMES W., JR. _____ *Instructor (English)*, 1967
B.A., M.A., University of Florida.
- ALLEN, WARD SYKES _____ *Associate Professor (English)*, 1964
B.A., M.A., Ph.D., Vanderbilt University.
- ALLEN, WILLIAM H., JR. _____ *Professor (Management)*, 1966
A.B., Centre College; J.D., M.A., University of Alabama; B.D., Union Theological Seminary.
- ALLEY, ALVIN D. _____ *Associate Professor (Secondary Education)*, 1966
B.A., M.A., Ph.D., Florida State University.
- ALLEY, J. LEE _____ *Lecturer (Microbiology)*, 1967
D.V.M., Auburn University.
- ALLISON, RAY _____ *Associate Professor (Fisheries and Allied Aquacultures)*, 1958, 1963
B.S., Western Carolina College; M.S., North Carolina State University.
- AMACHER, RICHARD E. _____ *Professor (English)*, 1957, 1965
A.B., Ohio University; Ph.D., University of Pittsburgh.
- AMLING, HARRY J. _____ *Professor (Horticulture)*, 1958, 1968
B.S., Rutgers University; M.S., University of Delaware; Ph.D., Michigan State University.
- AMOSS, JOHN W. _____ *Instructor (Electrical Engineering)*, 1969
B.E.E., Auburn University; M.S.E.E., Georgia Institute of Technology.
- ANDESON, ROBERT V. _____ *Associate Professor (Philosophy)*, 1965, 1969
A.A., Los Angeles City College; A.B., University of Chicago; A.M., Ph.D., University of Southern California.
- ANDERSON, DIANA K. _____ *Teaching Associate (English)*, 1970
B.A., Augustana College; M.A., Auburn University.
- ANDERSON, JOEL L. _____ *Assistant Professor (Vocational & Adult Education)*, 1967
B.S.E., M.R.C., University of Florida.
- ANDERSON, TERRANCE A. _____ *Assistant Professor (Music)*, 1970
B.Mus.Ed., M.Mus., University of Wisconsin; Ph.D., University of Iowa.
- ANDREWS, WARREN M. _____ *Associate Professor (Physics)*, 1961, 1970
B.S., Auburn University; M.S., Vanderbilt University; M.S., Ph.D., University of California.
- ANSON, CHARLES P. _____ *Professor (Economics & Geography)*, 1946
A.B., University of Wisconsin; M.A., Ohio State University; Ph.D., University of North Carolina.
- ANTHONY, CAROL H. _____ *Librarian (Educational Media)*, 1971
B.A., University of Cincinnati; B.S. in L.S., University of Illinois.
- ANTHONY, W. B. _____ *Professor (Animal & Dairy Sciences)*, 1953, 1955
B.S., University of Illinois; M.S., Texas A&M University; Ph.D., Cornell University.
- ARANT, FRANK S. _____ *Professor and Head (Zoology-Entomology)*, 1926, 1969
B.S., M.S., Auburn University; Ph.D., Iowa State University.
- ASKEW, RAYMOND F. _____ *Professor (Physics)*, 1960, 1969
B.S., Birmingham-Southern College; M.S., Ph.D., University of Virginia.
- ASKEW, WILLIAM C. _____ *Assistant Professor (Chemical Engineering)*, 1967
B.S., M.S., Auburn University; Ph.D., University of Florida.
- ATKINS, ALWYN J. _____ *Professor and Head (Secondary Education)*, 1956, 1964
B.S., University of Chattanooga; M.S., Ph.D., University of North Carolina.
- ATTLEBERGER, MARIE _____ *Associate Professor (Microbiology)*, 1947, 1959
D.V.M., M.S., Auburn University; Ph.D., University of Alabama.
- AUTREY, K. M. _____ *Professor (Animal & Dairy Sciences)*, 1947
B.S., Louisiana State University; M.S., Ph.D., Iowa State University.

- BAGWELL, JAMES E. _____ Assistant Professor (Geography), 1950, 1956
B.S., M.S., University of North Carolina.
- BAKER, J. MARSHALL _____ Professor (Chemistry), 1957, 1965
B.S., Missouri Valley College; M.S., Ohio State University; Ph.D., University of Missouri.
- BAKER, RICHARD A. _____ Executive Director (Alabama Advisory Council on
Vocational Education), 1963, 1971
B.S., M.S., Auburn University; Ed.D., Oklahoma State University.
- BAKER, RICHARD J. _____ Assistant Professor (Vocational & Adult Education), 1968
B.A., University of Louisville, M.A., George Peabody College for Teachers.
- BALL, RICHARD WILLIAM _____ Professor (Mathematics), 1954, 1960
B.A., M.A., Ph.D., University of Illinois.
- BARBIN, ALLEN RAY _____ Professor (Mechanical Engineering), 1961, 1967
B.S.M.E., Lamar State College of Technology; M.S.M.E., Texas A&M University; Ph.D., Purdue University.
- BARKSDALE, DAVID A. _____ Commanding Officer and Professor (Naval Science), 1969
B.S., U.S. Naval Academy; M.A., Stanford University; Captain, U.S. Navy.
- BARKSDALE, ROBBIE A. _____ Assistant Professor and Catalog Librarian,
(Library), 1949, 1969
A.B., University of Montevallo; B.S., M.S., Columbia University.
- BARNES, BEN B. _____ Director & Associate Professor (Computer Center), 1970
B.E.E., Auburn University; M.S.E.E., University of Alabama; Ph.D., Auburn University.
- BARNES, JAMES R. _____ Instructor (Vocational & Adult Education), 1969
B.S., M.S., Auburn University.
- BARRINGTON, WILLIAM NORMAN _____ Assistant Professor (Health, Physical
Education & Recreation), 1963
B.S., Auburn University; M.S., Peabody College.
- BARTELS, JAN E. _____ Associate Professor of Radiology (Veterinary Medicine), 1967, 1971
B.S., Oregon State University; D.V.M., Washington State University; M.S., University of Guelph.
- BASKERVILL, MARGARET M. _____ Associate Professor (Mathematics), 1943, 1965
A.B., Randolph-Macon Women's College; M.A., University of Michigan; Ph.D., Auburn University.
- BASS, MAX H. _____ Professor (Zoology-Entomology), 1957, 1970
B.S., Troy State University; M.S., Ph.D., Auburn University.
- BEALS, HAROLD O. _____ Associate Professor (Forestry), 1960, 1969
B.S.F., M.S., Ph.D., Purdue University.
- BEARD, ATHA _____ Assistant Professor (Accounting & Finance), 1965, 1969
B.S., M.B.A., Auburn University.
- BEASLEY, LOU C. _____ Instructor (Industrial Engineering), 1969
B.S., Mississippi College; M.S., Auburn University.
- BEASLEY, WILLIAM L., JR. _____ Assistant Professor (Counselor Education), 1970
B.A., Georgia State University; M.Ed., Ph.D., University of Georgia.
- BECKER, ROBERT C. _____ Assistant Professor (Accounting & Finance), 1968
B.B.A., University of Minnesota; M.B.A., Auburn University.
- BECKETT, SIDNEY DWAYNE _____ Associate Professor (Physiology &
Pharmacology), 1966
B.S., Mississippi State University; D.V.M., M.S., Auburn University; Ph.D., University of Missouri.
- BEILKE, PATRICIA F. _____ Assistant Professor (Educational Media), 1971
B.A., M.A., M.S.L., Ed.D., Western Michigan University.
- BELL, SIDNEY C. _____ Associate Professor (Agricultural Economics &
Rural Sociology), 1956, 1965
B.S., M.S., Auburn University; Ph.D., Michigan State University.
- BELLANTE, DONALD M. _____ Assistant Professor (Economics & Geography), 1970, 1971
B.S., Bryant College; M.B.A., Washington University; Ph.D., Florida State University.
- BELLANTE, HAZELENE W. _____ Assistant Professor (Family & Child Development), 1970
B.S., Florida State University; M.S., Washington University; Ph.D., Florida State University.
- BELSER, THOMAS A., JR. _____ Professor (History), 1957, 1968
B.A., M.A., Ph.D., Vanderbilt University.
- BENGSTON, EDWIN J. _____ Assistant Professor (Health, Physical Education
& Recreation), 1970
B.S., M.S., Springfield College.
- BENNETT, ALLISON C. _____ Assistant Professor (Agronomy & Soils), 1969
B.S., M.S., Oklahoma State University; Ph.D., Auburn University.

- BENNETT, RALPH BLOUNT. *Alumni Associate Professor (Mathematics)*, 1966, 1969
B.S., Illinois Institute of Technology; M.A., Ph.D., University of Tennessee.
- BENSON, CARL. *Hargis Professor (English)*, 1947, 1965
B.A., M.A., University of Texas; Ph.D., University of Illinois.
- BENSON, GEORGE L. *Instructor (Botany & Plant Pathology)*, 1969
B.S., M.S., University of South Carolina.
- BENTLEY, CHARLES A. *Associate Professor (Music)*, 1949, 1957
B.S.M., Baldwin-Wallace College; M.A., Professional Diploma, "Specialist in Music Education," Ed.D., Columbia University.
- BENTLEY, CHARLES S. *Assistant Dean Student Affairs*, 1951, 1968
B.S., M.S., Auburn University.
- BENZ, GERALD W. *Assistant Professor (Pathology & Parasitology)*, 1967
B.S., D.V.M., Purdue University; M.S., Ph.D., University of Wisconsin.
- BERGER, ROBERT S. *Professor (Zoology-Entomology)*, 1963, 1970
B.S., M.S., Texas A&M University; Ph.D., Cornell University.
- BERRY, CHARLES D. *Assistant Professor (Agronomy & Soils)*, 1968
B.S., Texas A&M University; M.S., Ph.D., Purdue University.
- BICE, LAWRENCE NEAL. *Assistant Professor (Accounting & Finance)*, 1968
B.S., M.A., University of Alabama.
- BIBLIS, EVANGELOS J. *Associate Professor (Forestry)*, 1965
B.F., University of Thessaloniki; M.F., D.F., Yale University.
- BIRKETT, JOHN E. *Extension Engineer (Engineering Extension Service)*, 1971
B.S.A.E., Parks Air College.
- BIZILIA, WESLEY M. *Assistant Basketball Coach (Athletic Department)*, 1970
B.S., Livingston State University.
- BLACKSTONE, JOHN H. *Professor (Agricultural Economics & Rural Sociology)*, 1938, 1953
B.S., M.S., Auburn University.
- BLAKE, GEORGE H., JR. *Professor (Zoology-Entomology)*, 1947, 1965
B.S., M.S., Auburn University; Ph.D., University of Illinois.
- BLAKNEY, WILLIAM G. G. *Associate Professor (Technical Services)*, 1958, 1961
B.S., Nova Scotia Technical College; M.Sc., Ohio State University.
- BOGIE, DONALD W. *Assistant Professor (Sociology)*, 1971
B.A., Georgetown College; M.A., Ph.D., University of Kentucky.
- BOLAND, JOSEPH S., III. *Associate Professor (Electrical Engineering)*, 1961, 1968
B.S.E.E., M.S., Auburn University; Ph.D., Georgia Institute of Technology.
- BOND, ALETHA WILSON. *Instructor (Health, Physical Education & Recreation)*, 1967
A.B., Coker College; M.Ed., Auburn University.
- BOND, EVELYN BRANCH. *Assistant Professor (Management)*, 1965, 1968
B.S., Berry College; M.Ed., Auburn University.
- BOND, GORDON C. *Assistant Professor (History)*, 1967
B.S., M.A., Ph.D., Florida State University.
- BORING, JOSEPH G. *Instructor (Veterinary Medicine)*, 1970
B.S., Louisiana Polytechnic Institute; D.V.M., Auburn University.
- BOSTON, ROBERT O. *Associate Professor (Economics & Geography)*, 1950, 1959
B.S., M.S., University of Alabama.
- BOTTOMS, DAVID NEWTON. *Associate Professor (Vocational & Adult Education)*, 1941, 1947
B.S., M.S., Auburn University.
- BOYD, CLAUDE E. *Associate Professor (Fisheries & Allied Aquacultures)*, 1971
B.S., M.S., Mississippi State University; Ph.D., Auburn University.
- BOYD, ROBERT P., JR. *Assistant Professor (Industrial Engineering)*, 1968
B.S., Auburn University.
- BOYLES, WILEY R. *Associate Professor (Psychology)*, 1970
B.S., University of Chattanooga; Ph.D., University of Tennessee.
- BRADFORD, JOHN H. *Instructor (Sociology)*, 1960
B.A., David Lipscomb College; M.S.W., University of Tennessee.
- BRADLEY, MARY HART. *Assistant Dean of Women, Social Center*, 1962
B.S., M.A., University of Alabama.
- BRANDT, PAUL C. H. *Professor and Head (Building Technology)*, 1968
B.S., M.S., University of Illinois.
- BRANCH, CHARLES E. *Research Associate (Physiology & Pharmacology)*, 1970
B.M.E., Auburn University.

- BRANSFORD, THOMAS L. _____ Professor (Civil Engineering), 1965
B.E., C.E., Vanderbilt University.
- BRESSLER, RAY B., JR. _____ Assistant Professor (Management), 1968
B.B.A., University of Cincinnati; M.B.A., Indiana University.
- BREWER, ROBERT N. _____ Assistant Professor (Poultry Science), 1968
B.S., M.S., Auburn University; Ph.D., University of Georgia.
- BREYER, BERNARD R. _____ Professor (English), 1949, 1966
B.A., Vanderbilt University; M.A., Louisiana State University; Ph.D., University of Virginia.
- BRINKLEY, WILLIAM A. _____ Assistant Professor (Military Science), 1969
B.S., Tennessee Tech., Captain, U.S. Army.
- BRITTIN, NORMAN A. _____ Hollifield Professor (English), 1948, 1967
A.B., A.M., Syracuse; Ph.D., University of Washington.
- BRITTIN, RUTH L. _____ Assistant Professor (English), 1970
B.S., M.A., Auburn University.
- BROCK, HAROLD NELSON _____ Instructor (Accounting & Finance), 1972
B.S., Florence State University; M.Ed., Auburn University.
- BROOKS, GEORGE H. _____ Professor and Head (Industrial Engineering), 1966
B.I.E., University of Florida; M.S.I.E., Ph.D., Georgia Institute of Technology.
- BROOKS, J. DOUGLAS _____ Extension Associate (Vocational & Adult Education), 1971
A.A., North Greenville Jr. College; B.A., M.A., Furman University.
- BROUSSEAU, MARY C. _____ Instructor (Family & Child Development), 1971
B.S., Louisiana State University; M.S., Cornell University.
- BROWN, CAROLYN B. _____ Instructor (English), 1967
B.A., M.A., Louisiana State University.
- BROWN, CHARLES D., JR. _____ Assistant Professor (Philosophy), 1967
B.A., M.A., Louisiana State University; Ph.D., University of Missouri.
- BROWN, DAVID B. _____ Assistant Professor (Industrial Engineering), 1972
B.S., Rutgers University; M.S., Montana State University; Ph.D., Texas Technological University.
- BROWN, HELEN WEAVER _____ Assistant Professor (Management), 1959, 1964
B.S., Alabama College; M.Ed., Auburn University.
- BROWN, JACK BETHEL _____ Associate Professor (Mathematics), 1967, 1971
B.A., M.A., Ph.D., University of Texas.
- BROWN, STEPHEN H. _____ Assistant Professor (Mathematics), 1970
B.S.E.E., M.A.M., Ph.D., North Carolina University.
- BRYANT, JOHN H. _____ Alumni Assistant Professor (Architecture), 1970
B. of Arch., Oklahoma State University; M. of Arch., University of Illinois.
- BUCHANAN, GALE ARLOH _____ Associate Professor (Agronomy & Soils), 1965, 1970
B.S., M.S., University of Florida; Ph.D., Iowa State University.
- BUDENSTEIN, PAUL P. _____ Associate Professor (Physics), 1958, 1962
B.A., Temple University; M.S., Ph.D., Lehigh University.
- BURNETT, PAUL C. _____ Professor (English), 1948, 1964
B.A., Louisiana Polytechnic Institute; M.A., Louisiana State University.
- BURNS, MOORE J. _____ Professor (Physiology & Pharmacology), 1950, 1962
B.S., M.S., Auburn University; Ph.D., Purdue University.
- BURTON, JOSEPH C. _____ Instructor (Vocational & Adult Education), 1968
B.S., M.S., Auburn University.
- BURTON, LEONARD PATILLO _____ Professor and Head (Mathematics), 1954, 1965
A.B., M.A., University of Alabama; Ph.D., University of North Carolina.
- BUSCH, CHARLES D. _____ Associate Professor (Agricultural Engineering), 1969
B.S., Cornell University; M.S., Utah State University; Ph.D., Cornell University.
- BUSCH, RUTH C. _____ Assistant Professor (Sociology), 1970
A.B., Cornell University; M.S., Utah State University; Ph.D., University of Arizona.
- BUSHEY, JOHN MICHAEL _____ Assistant Professor (Economics & Geography), 1967, 1969
B.S., University of Pennsylvania; M.S., Auburn University.
- BUSSELL, WILLIAM H. _____ Professor (Mechanical Engineering), 1965
B.M.E., M.S.E., University of Florida; Ph.D., Michigan State University.
- BUTLER, ALLEN DEXTER _____ Assistant Professor (English), 1927, 1955
A.B., M.A., University of North Carolina.
- BUTLER, WILLIAM H. _____ Assistant Professor (Physics), 1969
B.S., Auburn University; Ph.D., University of California.
- BUTZ, ROBERT K. _____ Professor (Mathematics), 1950, 1963
B.S., Colorado State University; M.S., Ph.D., University of Georgia.

- BYRD, WAYNE W. _____ *Assistant Professor (Military Science)*, 1970
B.S., University of Southern Mississippi; Captain, U.S. Army.
- CADENHEAD, A. KENNETH _____ *Associate Professor (Elementary Education)*, 1963, 1969
B.S., M.Ed., University of Georgia; Ed.D., Auburn University.
- CAHOON, DELWIN D. _____ *Alumni Associate Professor (Psychology)*, 1965, 1969
B.A., Ph.D., University of Minnesota.
- CAIN, JOHN L. _____ *Director, Engineering Program (Engineering Extension Service)*, 1962
B.Ch.E., Georgia Institute of Technology.
- CALDER, JAMES RICHARD _____ *Assistant Professor (Mathematics)*, 1968
B.S., Trinity of Texas; M.A., Ph.D., University of Texas.
- CALDWELL, TUSKIN J., III _____ *Extension Associate (Vocational & Adult Education)*, 1970
B.S., Alabama College; M.A., University of Alabama.
- CALLAN, ALLIE WILLIS, JR. _____ *Assistant Professor (Aerospace Engineering)*, 1968
B.S., University of Maryland; M.S., George Washington University.
- CAMPBELL, BILLY J. _____ *Assistant Professor (Educational Administration)*, 1971
B.S., M.S., Troy State University; Ed.D., Auburn University.
- CAMPBELL, LESLIE C. _____ *Assistant Dean, School of Arts and Sciences*, 1968
B.S., Mississippi State University; M.A., Ph.D., University of Mississippi.
- CANNON, J. LEWIS, III _____ *Extension Associate (Political Science)*, 1971
B.S.M., Stephen F. Austin State University; M.A., Sam Houston State University.
- CANNON, ROBERT Y. _____ *Professor (Animal & Dairy Sciences)*, 1948, 1960
B.S., Iowa State University; M.S., Ohio State University; Ph.D., University of Wisconsin.
- CAPPS, JULIUS DANIEL _____ *Professor (Chemistry)*, 1934, 1970
B.S., M.S., Auburn University; Ph.D., University of Nebraska.
- CARR, HOWARD E. _____ *Professor and Head (Physics)*, 1948, 1953
B.S., Auburn University; M.A., Ph.D., University of Virginia.
- CARRINGTON, THOMAS J. _____ *Professor and Head (Geology)*, 1967
B.S., M.S., University of Kentucky; Ph. D., Virginia Polytechnic Institute.
- CARROLL, BILLY D. _____ *Assistant Professor (Electrical Engineering)*, 1970
B.S.E.E., M.S.E.E., Ph.D., University of Texas.
- CARROLL, CHESTER C. _____ *Professor and Head (Electrical Engineering)*, 1965, 1969
B.S.E.E., M.S.E.E., Ph.D., University of Alabama.
- CARTER, MARION BERNARD _____ *Instructor (Electrical Engineering)*, 1967
B.S.E.E., M.S.E.E., University of Tennessee.
- CARTER, MARY FRANCES _____ *Associate Professor (Architecture)*, 1964, 1969
A.B., University of Georgia; M.A., Columbia University; Diploma, Parson School of Design.
- CARTER, MASON C. _____ *Alumni Associate Professor (Botany & Microbiology)*, 1960, 1969
B.S., M.S., Virginia Polytechnic Institute; D.F., Duke University.
- CAUGHRAN, WILLIAM H. _____ *Counselor (Vocational Rehabilitation)*, 1970
B.S., Athens College; M.A., George Peabody College.
- CAUSEY, CLARENCE R. _____ *Assistant Professor (Elementary Education)*, 1970, 1971
A.B., Birmingham Southern College; M.A., University of Alabama; Ed.D., Auburn University.
- CAUSEY, MILES K. _____ *Assistant Professor (Zoology-Entomology)*, 1968
B.S., M.S., Ph.D., Louisiana State University.
- CHAMBLISS, OYETTE L. _____ *Associate Professor (Horticulture)*, 1970
B.S., M.S., Auburn University; Ph.D., Purdue University.
- CHASTAIN, E. D., JR. _____ *Professor (Economics & Geography)*, 1956, 1963
B.S., Clemson University; M.S., Cornell University; Ph.D., Purdue University.
- CHASTAIN, MARIAN F. _____ *Associate Professor (Nutrition & Foods)*, 1956, 1966
B.S., Cedar Crest College; M.S., Ph.D., Florida State University.
- CHEATHAM, BEN H., JR. _____ *Assistant Professor (Secondary Education)*, 1969
B.A., M.Ed., Ed.D., University of Florida.
- CHERELLIA, GEORGE _____ *Instructor (Health, Physical Education, & Recreation)*, 1968
B.S., University of Houston; M.Ed., Rutgers University.
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B.S., National Taiwan University; M.S., University of Nebraska.
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B.S., University of Connecticut; M.F., Yale University; Ph.D., Michigan State University
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B.S., Auburn University.
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B.S., M.S., University of Rhode Island; Ph.D., Louisiana State University.
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B.S., D.V.M., Washington State University; M.S., Ph.D., Ohio State University.
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B.S., M.S., Ph.D., University of Minnesota.
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B.S., M.S., University of Southern Mississippi.
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B.S. Clemson University; M.S., Illinois Institute of Technology.
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B.S., University of Southwestern Louisiana; M. Litt., University of Pittsburgh; Ph.D., New Mexico State University.
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B.Mus.Ed., Murray State University; M.A., Western Reserve University.
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B.S., Kansas State University; Ph.D., University of Utah.
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B.A., George Washington University; Captain, U.S. Air Force.
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B.S., University of Georgia.
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B.S., M.Ed., Auburn University.
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B.Sc., Universidad Central De Venezuela; M.Sc., Ph.D., Rutgers University.
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A.B., Flora MacDonald College; B.S.L.S., University of North Carolina.
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B.S., Presbyterian College; M.A., University of North Carolina; Ph.D., University of Michigan.
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B.S., Pennsylvania State University; M.S., Washington University.
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B.S., Northwestern University; M.S., Auburn University.
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B.S., M.S., Cornell University; Ph.D., Florida State University.
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B.S., M.S., Auburn University; Ph.D., Virginia Polytechnic Institute.
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B.S., M.S., Auburn University.
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B.S., Troy State University; M.S., Auburn University; Ph.D., George Peabody College.
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B.S., M.S., Auburn University.
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B.S., M.S., University Southern Mississippi; Ph.D., Purdue University.
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B.S.M.E., Lamar State College of Technology; M.S.M.E., Georgia Institute of Technology.
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B.A., George Washington University.
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B.S., M.A., Mississippi State University; M.A., Peabody College; Ph.D., University of Alabama.
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A.B., Sterling College; M.S., Kansas State University; Ph.D., University of Wisconsin; Sc.D., Sterling College.
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B.S., University of Oregon; Major, U.S. Army.
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B.S., Portland State College; M.S., Ph.D., Utah State University.
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B.A., M.A., Oxford University.
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B.A., M.A., University of Alabama.
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B.S., Auburn University.
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B.S.T.E., Auburn University.
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B.A., Oklahoma State University; M.A., University of Kansas.
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B.S.M.E., M.S.M.E., Ph.D., University of Florida.
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B.S., M.Ed., Auburn University.
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B.B.A., University of Georgia; Lieutenant, U.S. Navy.
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B.S., D.V.M., Purdue University; M.S., Ph.D., Iowa State University.
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B.S., Bradley University; M.S., University of Chicago; Ph.D., Loyola University of Chicago.
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B.M.E., University of Florida; M.S., Air Force Institute of Technology; Colonel, U.S. Air Force.
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B.S.Ed., M.Ed., University of Florida; Ed.D., University of Georgia.
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B.A., Brigham Young University; M.A., Utah University; Ph.D., Indiana University.
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B.S.I.M., M.S.I.M., Georgia Tech; Ph.D., University of Georgia.

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B.S., Berry College; M.S., Stout Institute; Ed.D., Indiana University.
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D.M., M.S.V., Auburn University; Ph.D., Purdue University.
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A.B., University of Michigan; M.A., Eastern Michigan University.
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B.Arch., M.Arch., University of Michigan.
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B.F.A., Auburn University; M.F.A., Instituto Allende.
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B.S., M.A., School of Art, East Carolina University; M.F.A., Instituto Allende.
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B.A., Auburn University.
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B.S., Auburn University; M.A., University of Alabama.
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B.S., M.S.C.E., Drexel University; Ph.D., Stanford University.
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B.S., West Chester State College.
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B.S., M.S., Oklahoma State University; Ph.D., University of Texas at Austin.
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B.S., M.S., Auburn University.
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B.S., Massachusetts Institute of Technology; M.S., University of Florida.
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B.S., M.Ed., Auburn University.
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B.S., Cornell University; M.S., Ph.D., University of Maryland.
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B.S., Kansas State Teachers College; Librarian Degree, University of Havana; M.A., Auburn University.

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B.S., B.A., University of Havana; M.L.S., Kansas State Teachers College; M.A., Auburn University; LL.D., University of Havana.
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B.S., M.A., Austin Peay State University; Ed.D., Auburn University.
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B.A.A., Technical Institute of Berne; B.L.D., M.I.D., Ulm Graduate School of Design.
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B.S., M.S., Ph.D., Iowa State University.
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B.A., Franklin & Marshall College; M.A., Ph.D., University of Missouri.
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A.B., Miami University; A.M., Duke University; Ph.D., Ohio State University.
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D.V.M., Auburn University.
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B.A., Judson College; M.Ed., Auburn University.
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B.C.E., M.S., Auburn University.
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B.S., Auburn University.
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B.S., University of Maine; M.S., University of Delaware.
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B.S., M.S., Illinois, Captain, U.S. Air Force.
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B.S., Huntington College; M.L.S., Emory University.
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B.S., Birmingham-Southern College; M.S., Tulane University; M.A., University of Michigan.

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B.S., Ohio State University; M.A., Colorado State University.
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B.B.C., B.C.E., Auburn University.
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B.M., Auburn University.
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B.S., M.S., University of Georgia.
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B.A., Webster College; M.A., University of Denver.
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B.S., Auburn University; M.S., University of Pittsburgh.
- TRUELOVE, BRYAN _____ *Associate Professor (Botany & Microbiology)*, 1967
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B.S., M.S., Ph.D., Auburn University.
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B.S., U.S. Military Academy; Major, U.S. Army.
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B.A., Tulane University; M.Ed., Auburn University.
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B.S., Auburn University; M.D., Louisiana State University Medical Center.
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B.A., Southwestern Louisiana University; M.A., M.S., Louisiana State University; Ph.D., New York University.
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B.S., Auburn University; M.S., University of Illinois.
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B.S., Southwestern State Teachers College; M.A., Colorado State College of Education.
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B.M.E., M.S.N.S., Auburn University; Ph.D., Oklahoma State University; LL.B., Jones Law School.
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B.S., M.S., North Carolina State University; Ph.D., North Carolina State University.
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B.A., Hardin-Simmons University; M.Ed., University of Houston; Ph.D., University of Georgia.
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B.S., M.A., Louisiana State University; M.S., Auburn University.
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B.S., Auburn University; M.S., Columbia University.
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B.A., University of Texas.
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B.A., Millsaps College; M.A., Ph.D., Mississippi State University.
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B.S., Auburn University; Captain, United States Air Force.
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B.S., M.Ed., Auburn University.
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B.S.T.M., Auburn University; M.S., Institute of Textile Technology.
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A.B., Cornell University; M.A., Yale University; Ph.D., University of California at Berkeley.
- WALL, JAMES R. — *Instructor (Mathematics)*, 1971
A.B., Knox College; M.A., University of Nebraska; Ph.D., University of Tennessee.
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A.B., Tift College; B.S.L.S., Peabody College; M.Ed., Auburn University.
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B.V.A., M.F.A., Auburn University.
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B.A., Roosevelt University; M.A., Ph.D., Northwestern University.
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B.S., Mississippi College; M.A., University of Mississippi.
- WARD, C. H. — *Professor (Chemistry)*, 1957, 1965
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- WARD, CHARLOTTE R. — *Assistant Professor (Physics)*, 1959, 1964
B.S., University of Kentucky; M.S., Ph.D., Purdue University.
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B.S., B.S.L.S., New York State Teachers College; M.A., Ed.D., Columbia University.
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B.A., Auburn University; M.A., University of Florida.
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B.L.E., Georgia Institute of Technology; M.Ed., Ed.D., Auburn University.
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B.B.A., M.B.A., University of Georgia.
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B.A., Alabama College; M.S.L.S., University of North Carolina.
- WEAR, JOHN I. — *Professor (Agronomy & Soils)*, 1939, 1959
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B.S., M.S., North Carolina State University; Ph.D., Iowa State University.
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B.S., Marshall College; M.S., Wayne State University.
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B.S., Limestone College; M.S., Ph.D., Clemson University.
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B.S., Murray State University; M.S., University of Kentucky; Ph.D., University of Illinois.
- WILT, GERALD R. *Assistant Professor (Botany & Microbiology)*, 1962, 1965
B.S., Western Kentucky State University; M.S., Clemson University.
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B.S., M.S., Auburn University.
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B.S., M.S., Auburn University.
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B.A., University of Akron.
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B.S., Murray State University; M.A., University of Kentucky; Ph.D., Vanderbilt University.
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B.A., Huntington College; M.B.A., Auburn University.
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B.S., M.E., Auburn University.
- WRIGHT, CLARENCE D. *Instructor (Educational Media)*, 1970
B.S., University of Alabama; M.E., Auburn University.
- WRIGHT, JONE P. *Assistant Professor (Elementary Education)*, 1968
B.S., M.Ed., University of Georgia; Ph.D., University of Alabama.
- WRIGHT, THOMAS L. *Associate Professor (English)*, 1960, 1964
B.A., M.A., Ph.D., Tulane University.
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B.S.B.A., Auburn University; Lieutenant, U.S. Navy.
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B.S., U.S. Naval Academy; M.S., Auburn University; Lieutenant, U.S. Navy.
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B.S., M.S., Ed.D., Auburn University.
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B.S., Indiana University; A.M., Oberlin College; Ph.D., University of Notre Dame.
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B.S., M.S., Auburn University.
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B.S., M.S., Kansas State University.
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B.S.I.E., M.S.I.E., University of Florida; Ph.D., University of Houston.
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B.S., Otterbein College; M.S., Ph.D., University of Cincinnati.
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B.S., B.Arch., Rensselaer Polytechnic Institute; M.Arch., University of Oregon.

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B.S., M.S., Auburn University; M.S., University of Michigan; Ph.D., Columbia University.
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A.B., Emory and Henry College; M.A., Ph.D., University of Virginia; D.Sc., Auburn University; LL.D., Emory and Henry College.
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B.S., M.S., University of Illinois.
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Diploma, Massachusetts College of Art; B.S., M. App. Art, Auburn University.
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- BASORE, CLEBURNE A. _____ *Professor, Emeritus of Chemical Engineering*, June, 1963
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B.S., Arch., Washington State University; M.S., Arch., Columbia University.
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B.S., M.S.E.E., Auburn University.
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B.S., Georgia State College.
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- KALLA, PAUL J. _____ Assistant Director of Student Health, 1971
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 WILLIAMS, DUDLEY O. *Television Program Director, Educational Television, 1966, 1968*
 B.A., University of Kentucky.
 WILLIAMS, L. B. *Editor, University Publications, University Relations, 1956, 1962*
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Agricultural Economics and Rural Sociology

- YEAGER, J. H. *Professor and Head of Department, 1946, 1964*
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 DUNKELBERGER, J. E. *Associate Professor, 1962, 1967*
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 DRISCOLL, L. S. *Instructor, 1965*
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Animal Health Research

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Animal and Dairy Sciences

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Botany and Microbiology

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- DIENER, URBAN L.** *Professor, 1952, 1963*
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Fisheries and Allied Aquacultures

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Forestry

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B.S., Syracuse University; M.S., University of Florida.
- GARIN, G. I. *Professor, 1948, 1952*
B.S., M.S., University of Idaho; Ph.D., Yale University.
- GOGGANS, J. F. *Professor, 1947, 1963*
B.S., University of Georgia; M.F., Duke University; Ph.D., North Carolina State University.
- HODGKINS, E. J. *Professor, 1952, 1957*
B.S., Michigan State University; M.S., University of California; Ph.D., Michigan State University.
- JOHNSON, E. W. *Professor, 1950, 1967*
B.S., University of New Hampshire; M.F., Yale University; Ph.D., Syracuse University.
- BEALS, HAROLD O. *Associate Professor, 1960, 1969*
B.S.F., M.S., Ph.D., Purdue University.
- BIBLIS, EVANGELOS J. *Associate Professor, 1965*
B.F., University of Thessaloniki; M.F., D.F., Yale University.
- CARTER, MASON C. *Alumni Associate Professor, 1960, 1969*
B.S., M.S., Virginia Polytechnic Institute; D. F., Duke University.
- LARSEN, H. S. *Associate Professor, 1959, 1970*
B.S., Rutgers University; M.S., Michigan State University; Ph.D., Duke University.
- POSEY, H. G. *Associate Professor, 1950, 1959*
B.S.F., M.S.F., North Carolina State University.
- WHIPPLE, S. D. *Associate Professor (Rt. 2, Fayette), 1958*
B.S., M.F., University of Michigan.
- DAVIS, TERRY C. *Assistant Professor, 1965*
B.S., M.S., Virginia Polytechnic Institute; Ph.D., West Virginia University.
- DEBRUNNER, L. E. *Assistant Professor, 1961*
B.S., University of Cincinnati; M.F., Yale University; D.F., Duke University.
- LIVINGSTON, K. W. *Assistant Professor, 1948, 1949*
B.S., University of South Carolina; M.F., Duke University.
- LYLE, E. S., JR. *Assistant Professor, 1957*
B.S., University of Georgia; M.F., Duke University; Ph.D., Auburn University.
- CHIU, Y. M. *Research Associate, 1970*
B.S., National Taiwan University; M.S., Auburn University.
- DILL, T. R. *Research Associate, 1970*
B.S., New Mexico State University.
- GOODING, J. W., III *Research Associate, 1969*
B.S., M.S.F., University of Florida.
- LYNCH, K. D. *Research Associate, 1969*
B.S., M.S., Oklahoma State University.

MEIER, R. J. _____ *Research Associate, 1971*
 B.S., Michigan Technical University; M.S., University of Illinois.

Home Economics Research

COMPTON, NORMA H. _____ *Head of Department and Dean, School
 of Home Economics, 1968*
 A.B., George Washington University; M.S., Ph.D., University of Maryland.

DAVIS, ELIZABETH Y. _____ *Coordinator of Research and Professor, 1957, 1969*
 B.S., Colorado State University; M.S., Ph.D., Auburn University.

GALBRAITH, RUTH LEGG _____ *Professor, 1970*
 B.S., Ph.D., Purdue University.

VAN DE MARK, MILDRED S. _____ *Professor, 1938, 1964*
 B.S., Auburn University; M.A., Columbia University.

DRISKELL, JUDY A. _____ *Assistant Professor, 1970*
 B.S., University of Southern Mississippi; M.S., Ph.D., Purdue University.

HARDIN, IAN _____ *Assistant Professor, 1971*
 B.S., Auburn University; M.S., Institute of Textile Technology; Ph.D., Clemson University.

WILLIAMS, JENNIFER _____ *Instructor, 1971*
 B.S., Georgia Southern College; M.S., Auburn University.

Horticulture

PERKINS, DONALD Y. _____ *Professor and Head of Department, 1966*
 B.S., M.S., Louisiana State University; Ph.D., Cornell University.

AMLING, HARRY J. _____ *Professor, 1958, 1968*
 B.S., Rutgers University; M.S., University of Delaware; Ph.D., Michigan State University.

GREENLEAF, W. H. _____ *Professor, 1947*
 B.S., Ph.D., University of California at Berkeley.

ORR, HENRY P. _____ *Professor, 1947, 1962*
 B.S., Auburn University; M.S., Ph.D., Ohio State University.

CHAMBLISS, OYETTE L. _____ *Associate Professor, 1970*
 B.S., M.S., Auburn University; Ph.D., Purdue University.

HARRIS, HUBERT _____ *Associate Professor, 1936, 1948*
 B.S., M.S., Auburn University.

NORTON, JOSEPH D. _____ *Associate Professor, 1960, 1967*
 B.S., M.S., Auburn University; Ph.D., Louisiana State University.

PERRY, FREDERICK B., JR. _____ *Associate Professor, 1957, 1971*
 B.S., M.S., Auburn University; Ph.D., University of Georgia.

SANDERSON, KENNETH C. _____ *Associate Professor, 1966, 1970*
 B.S., Cornell University; M.S., Ph.D., University of Maryland.

DOZIER, W. ALFRED, JR. _____ *Assistant Professor, 1965, 1971*
 B.S., M.S., Auburn University; Ph.D., Virginia Polytechnic Institute.

JOHNSON, W. A. _____ *Assistant Professor, 1937, 1950*
 B.S., M.S., Auburn University.

RYMAL, KENNETH S. _____ *Assistant Professor, 1966*
 B.S., Massachusetts Institute of Technology; M.S., University of Florida.

MARCUS, KAREN A. _____ *Research Associate, 1968*
 B.S., Auburn University.

MARTIN, W. C., JR. _____ *Instructor, 1951, 1958*
 B.S., Auburn University.

TURNER, JACK L. _____ *Research Associate, 1955, 1959*
 B.S., M.S., Auburn University.

BRYCE, HARRISON M. _____ *Field Superintendent, 1967, 1968*
 B.S., Auburn University.

Meteorology

MOTT, PAUL A. _____ *Advisory Agricultural Meteorologist (Coop. NOAA-USDC), 1962*

Poultry Science

MOORE, CLAUDE H. _____ *Professor and Head of Department, 1956, 1959*
 B.S., Auburn University; M.S., Kansas State University; Ph.D., Purdue University.

COTTIER, G. J. _____ *Professor, 1930, 1949*
 B.S., Auburn University; M.A., University of Missouri; D.V.M., Auburn University.

- EDGAR, S. A. _____ Professor, 1947, 1950
A.B., Sterling College; M.S., Kansas State University; Ph.D., University of Wisconsin; Sc.D., Sterling College.
- MORA, E. C. _____ Professor, 1958, 1967
B.S., University of New Mexico; M.S., New Mexico State University; Ph.D., Kansas State University.
- GOODMAN, J. G. _____ Associate Professor, 1939, 1946
B.S., M.S., Auburn University.
- JOHNSON, L. W. _____ Associate Professor, 1955
A.B., Cornell College; M.S., Auburn University; Ph.D., Texas A&M University.
- MCDANIEL, GAYNER R. _____ Associate Professor, 1968
B.S., M.S., Auburn University; Ph.D., Kansas State University.
- BREWER, ROBERT N. _____ Assistant Professor, 1968
B.S., M.S., Auburn University; Ph.D., University of Georgia.
- CHO, YUNG _____ Assistant Professor, 1969
D.V.M., National Taiwan University; M.S., Ph.D., Auburn University.

Publications

- WHITE, J. HERBERT _____ Director, University Relations, 1960, 1966
B.S., Auburn University.
- MCGRAW, E. L. _____ Editor and Head of Department, 1941, 1968
B.S., M.S., Auburn University.
- STEVENSON, R. E. _____ Associate Editor, 1955, 1960
B.S., Auburn University.
- HARWOOD, JOSEPH D. _____ Assistant Editor, 1968
B.S., Texas A&M University.

Research Data Analysis

- PATTERSON, R. M. _____ Professor, 1949, 1968
B.S., M.S., University of Florida; Ph.D., Pennsylvania State University.
- WILLIAMS, JOHN C., JR. _____ Associate Professor, 1970
B.S., M.S., North Carolina State University; Ph.D., Iowa State University.
- MCGUIRE, JOHN A. _____ Assistant Professor, 1968
B.S., M.S., Mississippi State University; Ph.D., Auburn University.
- HEARN, WILLIAM H. _____ Systems Analyst, 1950, 1963
B.S., Auburn University.
- RUF, MARVIN E. _____ Computer Programmer II, 1971
B.S., M.S., Auburn University.

Zoology-Entomology

- ARANT, F. S. _____ Professor and Head of Department, 1926, 1949
B.S., M.S., Auburn University; Ph.D., Iowa State University.
- BASS, MAX H. _____ Professor, 1959, 1969
B.S., Troy State University; M.S., Ph.D., Auburn University.
- BERGER, ROBERT S. _____ Professor, 1963, 1969
B.S., M.S., Texas A&M University; Ph.D., Cornell University.
- DENDY, JOHN STILES _____ Professor, 1947, 1957
B.S., Presbyterian College; M.A., University of North Carolina; Ph.D., University of Michigan.
- HAYS, KIRBY LEE _____ Professor, 1957, 1964
B.S., M.S., Auburn University; Ph.D., University of Michigan.
- CUNNINGHAM, HUGH B. _____ Associate Professor, 1951, 1965
B.S., M.S., Auburn University; Ph.D., University of Illinois.
- GILLILAND, FLOYD R. _____ Associate Professor, 1967, 1971
B.S., Arkansas Polytechnic College; M.S., University of Arkansas; Ph.D., Mississippi State University.
- HYCHE, LACY L. _____ Associate Professor, 1952, 1960
B.S., M.S., Auburn University.
- IVEY, W. D. _____ Associate Professor, 1947, 1962
B.S., M.S., Auburn University; Ph.D., Emory University.
- RAMSEY, JOHN S. _____ Associate Professor, 1967, 1970
B.S., Cornell University; Ph.D., Tulane University.
- SPEAKE, DAN W. _____ Associate Professor, 1955, 1970
B.S., M.S., Ph.D., Auburn University.

- CAUSEY, MILES K. _____ Assistant Professor, 1968
B.S., M.S., Ph.D., Louisiana State University.
- ESTES, PAUL M. _____ Assistant Professor, 1966
B.Sc., Purdue University; Ph.D., University of California.
- HARPER, JAMES D. _____ Assistant Professor, 1969
B.S., M.S., University of Illinois; Ph.D., Oregon State University.
- KOUSKOLEKAS, COSTAS A. _____ Assistant Professor, 1967
B.S., University of Thessaloniki; M.S., University of Missouri; Ph.D., University of Illinois.
- HILL, EDWARD P., III _____ Assistant Leader, Wildlife Research Unit, 1967
B.S., Oregon State University; M.S., Ph.D., Auburn University.

SUBSTATIONS AND FIELDS

Black Belt—Marion Junction, Dallas County

- SMITH, L. A. _____ Superintendent, 1951, 1957
B.S., Auburn University.
- GRIMES, HAROLD W., JR. _____ Assistant Superintendent, 1955, 1957
B.S., M.S., Auburn University.

Chilton Area Horticulture—Clanton, Chilton County

- CARLTON, C. C. _____ Superintendent, 1948
B.S., Auburn University.
- SHORT, KENNETH C. _____ Assistant Superintendent, 1960
B.S., Auburn University.

Gulf Coast—Fairhope, Baldwin County

- YATES, HAROLD F. _____ Superintendent, 1931, 1959
B.S., Auburn University.
- BARRETT, J. E., JR. _____ Assistant Superintendent, 1948
B.S., Auburn University.
- MCDANIEL, N. R. _____ Assistant Superintendent, 1969
B.S., M.S., Auburn University.

Lower Coastal Plain—Camden, Wilcox County

- BROWN, V. L. _____ Superintendent, 1949
B.S., Mississippi State University.
- FOWLER, WILLIAM E. _____ Assistant Superintendent, 1965
B.S., Berry College.
- WADE, ROBERT H. _____ Assistant Superintendent, 1971
B.S., M.S., Auburn University.
- WATSON, W. J. _____ Assistant Superintendent, 1958
B.S., Auburn University.

North Alabama Horticulture—Cullman, Cullman County

- HOLLINGSWORTH, M. H. _____ Superintendent, 1958, 1962
B.S., Auburn University.

Piedmont—Camp Hill, Tallapoosa County

- MAYTON, E. L. _____ Superintendent, 1929, 1945
B.S., Auburn University; M.S., University of Vermont.
- BURGESS, HOYT E. _____ Assistant Superintendent, 1967
B.S., Auburn University.

Sand Mountain—Crossville, DeKalb County

- GISSENDANNER, S. E. _____ Superintendent, 1941, 1946
B.S., Auburn University.

Tennessee Valley—Belle Mina, Limestone County

- BOSECK, J. K. _____ Superintendent, 1937, 1954
B.S., Auburn University.
- WEBSTER, W. B. _____ Assistant Superintendent, 1958, 1965
B.S., M. of Agri., Auburn University.

Upper Coastal Plain—Winfield, Fayette & Marion Counties

- MOORE, ROBERT A., JR. _____ *Superintendent*, 1959, 1969
 B.S., M. of Agri., Auburn University.
- WALLACE, B. J. _____ *Assistant Superintendent*, 1969
 B.S., Auburn University.

Wiregrass—Headland, Henry County

- STARLING, J. G. _____ *Superintendent*, 1948, 1972
 B.S., Auburn University.
- IVEY, HENRY W. _____ *Assistant Superintendent*, 1960, 1966
 B.S., Auburn University.

Ornamental Horticulture Field Station—Spring Hill, Mobile County

- SELF, R. L. _____ *Plant Pathologist*, 1942, 1952
 B.S., M.S., Auburn University; Ph.D., University of Wisconsin.
- DRISKELL, NATHAN A. _____ *Assistant Superintendent*, 1967
 B.S., Louisiana State University.
- SUBIRATS, FERNANDO J. _____ *Research Associate*, 1968, 1970
 B.S., University of Havana; M.S., Auburn University.

Brewton & Monroeville Fields—Escambia & Monroe Counties

- CARDEN, EMMETT _____ *Superintendent (Brewton)*, 1969
 B.S., M.S., Auburn University.

Prattville & Tuskegee Fields—Autauga & Macon Counties

- GLAZE, FRED T. _____ *Superintendent (Prattville)*, 1954, 1969
 B.S., Auburn University.

COOPERATIVE EXTENSION SERVICE STAFF

HARRY M. PHILPOTT, A.B., Ph.D., D.D., LL.D., LL.D., *President*

- ROBERTSON, FRED R., JR. _____ *Vice President for Extension*, 1959, 1966
 B.S., M.S., University of Tennessee; Dr.P.A., Harvard University.
- JONES, RALPH R. _____ *Director of Cooperative Extension Service*, 1936, 1971
 B.S., Auburn University; M.S., Michigan State University.
- TAYLOR, W. H. _____ *Associate Director*, 1946, 1971
 B.S., Auburn University; M.S., Ed.D., Cornell University.
- WARREN, HOYT M. _____ *Assistant Director*, 1945, 1965
 B.S., Auburn University; M.S., Ed.D., Cornell University.
- COLEMAN, MARY E. _____ *Assistant Director for Women's Work*, 1936, 1965
 B.S., Auburn University; M.A., Columbia University.
- HILL, W. B. _____ *Assistant to the Director*, 1935, 1965
 B.S., Tuskegee Institute; M.S., Cornell University; Ph.D., University of Wisconsin.
- BUFORD, JAMES A., JR. _____ *Director of Personnel*, 1965, 1971
 B.S., M.S., Auburn University.
- JOHNSON, PAUL O. _____ *Assistant to the Director*, 1959, 1970
 B.S., M.Ed., Auburn University; Ed.D., University of Georgia.
- HORN, ROBERT C. _____ *Head (Management Service)*, 1944, 1969
 B.S., Auburn University; M.S., University of Wisconsin.
- SHERER, RALPH L. _____ *Coordinator (Continuing Education)*, 1955, 1969
 B.S., Auburn University; M.S., Cornell University.
- WHITE, J. HERBERT _____ *Director (University Relations)*, 1960, 1966
 B.S., Auburn University.
- WHITE, LOUIS E. _____ *Conference Director*, 1962, 1969
 B.S., Auburn University; M.Ed., University of Alabama; Ed.D., North Carolina State University.

SUPERVISORS

- BULLINGTON, JOHN C. _____ *District Extension Chairman*, 1939, 1965
 B.S., Auburn University.

- DAVIS, S. L. _____ *District Extension Chairman, 1942, 1965*
B.S., Auburn University; M.S., Cornell University.
- LUMPKIN, T. W. _____ *District Extension Chairman, 1934, 1965*
B.S., Auburn University.
- McMILLAN, GEORGE D. H. _____ *District Extension Chairman, 1942, 1965*
B.S., Auburn University.
- HULSEY, MARY _____ *Associate District Extension Chairman, 1941, 1965*
B.S., Auburn University; M.A., Columbia University.
- IVEY, EUNICE _____ *Associate District Extension Chairman, 1949, 1965*
B.S., University of Montevallo; M.S., University of Alabama.
- MALLETTE, LUCILE _____ *Associate District Extension Chairman, 1936, 1965*
B.S., Auburn University; M.S., University of Minnesota.
- WALKER, CLEO S. _____ *Associate District Extension Chairman, 1958, 1971*
B.S., M.S., Tuskegee Institute.

DIVISION CHAIRMEN

- CAVENDER, A. R. _____ *Chairman (Resource Use Division), 1958, 1965*
B.S., M.S., University of Tennessee; Ph.D., University of Wisconsin.
- PARROTT, JOHN _____ *Chairman (Extension Information), 1941, 1969*
B.S., M.Ed., Auburn University.
- GOSSETT, JOHN WARREN _____ *Chairman (Animal Science Division), 1962*
B.S., University of Tennessee; M.S., Ph.D., Texas A&M University.
- HAGLER, THOMAS BENJAMIN _____ *Chairman (Plant Science Division), 1960*
B.S., M.S., Auburn University; Ph.D., University of Maryland.
- LANIER, WORTH _____ *Chairman (Environmental Health Division), 1960, 1969*
B.S., Mississippi State University; D.V.M., Auburn University.

ON-CAMPUS SPECIALISTS

- ALLEY, J. LEE _____ *Extension Veterinarian, 1969*
B.S., Auburn University; D.V.M., Auburn University.
- ANDREWS, OLIN N. _____ *Agronomist, 1942, 1955*
B.S., M.S., Auburn University.
- BALCH, TALMADGE G. _____ *Specialist in Pesticide Education, 1957, 1965*
B.S., M.Ag., Auburn University.
- BARNETT, JOHN W. _____ *Extension Entomologist, 1970*
B.S., M.S., Ph.D., Auburn University.
- BARR, ANN _____ *State 4-H Club Leader for Girls, 1945, 1950*
B.S., University of Montevallo.
- BICE, VERNON C. _____ *Radio & TV Editor, 1958, 1964*
B.S., M.Ag., Auburn University.
- BOND, M. D. _____ *Peanut Specialist, 1955, 1969*
B.S., M.Ag.Ed., Auburn University.
- BROWN, A. J. _____ *Specialist (Marketing), 1948, 1963*
B.S., M.Ag.Ec., Auburn University.
- BRYAN, ELIZABETH _____ *Economist (Home Management), 1939, 1957*
B.S., Auburn University; M.S., University of Tennessee.
- BURDETT, ROBERT A. _____ *Agronomist (Seed), 1968*
B.S., M.S., Auburn University.
- BURNETT, BERTRAM B. _____ *Extension Poultryman, 1970*
B.S., Ph.D., Auburn University.
- BURNS, EARL REECE _____ *Extension Weed Specialist, 1970*
B.S., M.S., Ph.D., Auburn University.
- CHAPMAN, LOUIE J. _____ *Specialist (Agronomy), 1967*
B.S., M.S., Auburn University; Ph.D., University of Florida.
- CHENEY, WALTER K. _____ *Art Editor, 1958, 1962*
B.A.A., Auburn University.
- CLARK, ROBERT R. _____ *Specialist (Recreation), 1954, 1965*
B.S., M.S., Auburn University.
- COLLINS, RICHARD JAMES _____ *Extension Plant Pathology Assistant, 1967*
B.S., University of Miami; M.S., Texas A&M University.
- COPELAND, KENNETH J. _____ *News Editor, 1957, 1960*
B.S., M.Ag.Ed., Auburn University.
- DANION, JAMES RICHARD _____ *Animal Husbandman, 1960, 1965*
B.S., M.S., University of Georgia; Ph.D., Auburn University.

- DAVIS, CECIL G. _____ District Program Specialist, 1948, 1966
B.S., M.Ag., Auburn University.
- DEESE, RICHARD E. _____ Animal Husbandman, 1965
B.S., M.S., Mississippi State University; Ph.D., University of Florida.
- DENNIS, CARL _____ Apiculturist, 1954, 1968
B.S., M.Ag., Auburn University.
- DOWNNEY, ISABELLE _____ Specialist (Food Preservation), 1944, 1958
B.S., Auburn University; M.S., University of Georgia.
- ELLIOTT, JOHN, JR. _____ Specialist (Pesticide Education), 1953, 1966
B.S., M.Ag., Auburn University.
- FARRAR, LUTHER L. _____ Specialist (Plant Pathology and Nematology), 1966
B.S., Centenary College; M.S., Ph.D., Louisiana State University.
- FITE, BARBARA A. _____ Specialist (Human Development), 1956, 1966
B.S., University of Montevallo; M.S., University of Alabama.
- GLASSCOCK, M. R. _____ Specialist (Fruits and Vegetable Marketing), 1941, 1962
B.S., Auburn University.
- HENDERSON, J. B. _____ Agronomist (Soybeans), 1960, 1969
B.S., M.S., Auburn University; Ph.D., North Carolina State University.
- HERD, DENNIS B. _____ Extension Animal Husbandman, 1967
B.S., Berea College; M.S., Ph.D., University of Kentucky.
- HIGH, THOMAS W., JR. _____ Extension Animal Husbandman, 1966
B.S., University of Florida; M.S., Ph.D., University of Tennessee.
- HOLLEY, BETTY B. _____ Specialist (Educational Methods), 1969
B.S., University of Tennessee; M.S., University of Alabama.
- HUDDLESTON, NORMAN R. _____ Economist, 1968
B.S., Tennessee Technological University; M.S., University of Tennessee; Ph.D., Mississippi State University.
- JONES, BERTHA MAE _____ 4-H Club Specialist, 1945, 1965
B.S., Alabama A&M University; M.Ed., Pennsylvania State University.
- JONES, R. S., JR. _____ Dairyman, 1941, 1959
B.S., Auburn University.
- KENNAMER, E. F. _____ Specialist (Wildlife), 1940, 1960
B.S., M.S., Auburn University.
- LIDBETTER, ROY J. _____ Entomologist, 1954, 1962
B.S., M.S., Auburn University; Ph.D., Mississippi State University.
- LEE, VERRON WILSON _____ Specialist (Poultry Marketing), 1965, 1967
B.S., Auburn University; M.S., University of Arizona.
- LINTON, DANIEL A., JR. _____ Specialist (Livestock Marketing), 1962
B.S., M.S., Auburn University.
- LITTLE, ROBERT L. _____ Specialist (Forest Products Marketing and Utilization), 1971
B.S., M.S., Clemson University.
- MADDOX, C. L. _____ Specialist (Farm Management), TVA, 1954, 1960
B.S., M.S., Auburn University.
- MARABLE, JOHNIE A. _____ District Program Specialist, 1955, 1966
B.S., M.S., Auburn University.
- MARABLE, VIRGINIA H. _____ Assistant Specialist (Educational Methods), 1969
B.S., Auburn University.
- MARTIN, NANCY W. _____ Specialist in Educational Methods, 1970
B.S., M.S., Auburn University.
- MAYFIELD, M. CECIL _____ State 4-H Club Leader, 1955, 1970
B.S., M.Ag., Auburn University.
- MCLAUGHLIN, KATHY M. _____ Specialist in Educational Methods, 1970
B.S., Winthrop College.
- MCQUEEN, HOUSTON FRANK _____ Survey Entomologist, 1963
B.S., Auburn University.
- OGBURN, CHARLES B. _____ Agricultural Engineer, 1968
B.S., M.S., Virginia Polytechnic Institute.
- OVERBY, DOROTHY _____ Specialist (Consumer Education), 1943, 1949
B.S., University of Tennessee.
- OWENS, BARBARA A. _____ Specialist (Educational Methods), 1958, 1969
B.S., Florence State University.
- PARRISH, J. R. _____ Dairyman, 1938, 1948
B.S., M.S., Auburn University.

- PEAVY, ALICE _____ *Economist (Home Furnishings)*, 1941, 1959
B.S., University of Alabama; M.A., Columbia University.
- POWELL, WILLIAM EDWARD, III _____ *Specialist in Food Science*, 1970
B.S., Ph.D., Auburn University.
- PRICKETT, FARISS _____ *Specialist in Foods and Nutrition*, 1955, 1970
B.S., M.S., Auburn University.
- RIVERS, RUTH L. _____ *Specialist (Community Health Education)*, 1937, 1969
B.S., Tuskegee Institute; M.A., Columbia University.
- SHUMACK, RONALD LEE _____ *Extension Floriculturist*, 1963, 1969
B.S., M.Ag.Ed., Auburn University.
- SMITH, JACK D. _____ *News Editor*, 1962
B.A., Auburn University.
- SMITH, JAMES L. _____ 1965, 1971
B.S., Edward Waters College; M.S., Tuskegee Institute; Ph.D., Ohio State University.
- SMITH, PERRY M. _____ *Extension Horticulturist—Vegetables*, 1966, 1969
B.S., Clemson University; M.S., North Carolina State University.
- SOWELL, WALTER F. _____ *Soils Specialist*, 1948, 1960
B.S., M.S., Auburn University; Ph.D., Purdue University.
- SPEAKMAN, GENTA S. _____ *Specialist (Housing and Equipment)*, 1966
B.S., M.S., Auburn University.
- STRAIN, WILLIE LEE _____ *News Editor*, 1955, 1965
B.S., M.Ed., Tuskegee Institute.
- STRAWN, HARRY _____ *Resource Development Economist*, 1969
B.S., North Carolina State University; M.S., Ph.D., University of Tennessee.
- STRICKLAND, ELMER OSCAR _____ *District Program Specialist*, 1961, 1963
B.S., M.Ag.Ed., Auburn University.
- THOMAS, CHARLES F. _____ *Specialist (Poultry)*, 1958, 1966
B.S., M.S., Auburn University.
- THOMPSON, KATHLEEN _____ *Specialist (Clothing)*, 1944, 1969
B.S., University of Alabama; M.S., Pennsylvania State University.
- THORNTON, NANCY H. _____ *Assistant to News Editor*, 1970
B.A.A., Auburn University.
- WADE, LARKIN H. _____ *Extension Forester*, 1965
B.S., M.S., Auburn University.
- WATSON, HAROLD _____ *Specialist (Agricultural Engineering)*, 1966
B.S., M.S., Louisiana State University.
- WEEKS, JOHN PETER _____ *Specialist in Rural Resource Development*, 1970
B.S., Auburn University.
- WHITE, VIRGINIA C. _____ *Specialist in Foods and Nutrition*, 1970
B.S., University of Montevallo; M.S., University of Tennessee.
- WHITTENBURG, BOBBY LEROY _____ *4-H Livestock Specialist*, 1965
B.S., M.S., University of Tennessee.
- WILBOURN, TERRY ALLEN _____ *Extension Horticulturist—Ornamentals*, 1970
B.S., M.S., Mississippi State University.
- WILLIAMS, GERTHEN E. _____ *Visual Editor*, 1960, 1967
B.S., Auburn University.

OFF-CAMPUS SPECIALISTS

- EICH, SAMUEL M. _____ *Specialist in Cotton*, 1957, 1968
B.S., M.Ag., Auburn University
- GIVHAN, JOE _____ *Rural Resource Development Specialist*, 1935, 1963
B.S., Auburn University.
- JONES, ROBERT F. _____ *Resource Management Specialist*, 1949, 1969
B.S., Tuskegee Institute; M.Ed., North Carolina State University.
- LINK, J. G. _____ *Agronomist, TVA*, 1959, 1963
B.S., M.S., Auburn University.
- MARKS, HERMAN _____ *District Program Specialist*, 1954, 1963
B.S., M.Ag.Ed., Auburn University.
- MCDANIEL, CLARENCE _____ *Resource Management Specialist*, 1952, 1969
B.S., M.S., Alabama A&M University.

PARKER, CARL	Rural Resource Development Specialist, 1944, 1961
B.S., M.Ag., Auburn University.	
ROBERTS, LARRY W.	Resource Management Specialist, 1960, 1968
B.S., M.S., Auburn University.	
SEGREST, CHARLES	Rural Resource Development Specialist, 1956, 1962
B.S., M.Ag.Ed., Auburn University.	
STORY, C. U.	Rural Resource Development Specialist, 1965
B.S., Auburn University; M.Ag., University of Florida.	
TIDWELL, MACON B.	Rural Resource Development Specialist, 1957, 1961
B.S., M.Ag., Auburn University.	
WILLIAMS, W. R.	Resource Management Specialist, 1946, 1968
B.S., Auburn University; M.S., University of Tennessee.	
WILSON, WILLIAM E.	Rural Resource Development Specialist, 1954, 1961
B.S., M.Ag., Auburn University.	

OTHER STAFF

BROWN, GRACE F.	Administrative Assistant, 1958, 1966
GOOD, MYRTLE	Administrative Assistant, 1929, 1966
JETER, DALENE	Administrative Assistant, 1928, 1966
JETER, RENNIE	Business Assistant, 1934, 1947

COUNTY STAFFS

(List for each county as follows: County Address, county extension chairman, extension farm agent; associate county extension chairman, extension home agent; first appointment, present appointment. All degrees are from Auburn University unless otherwise indicated.)

AUTAUGA Prattville	R. H. Kirkpatrick, B.S., M.Ed.; 1944, 1965; Jerry A. Green, B.S., Tuskegee Institute, 1954, 1965; Max F. Scott, B.S., M.Ag., 1962-1965. Frances E. Puckett, B.S., Mississippi State College for Women, 1969, 1970; Louvenia A. Lee, B.S., Tuskegee Institute, 1955, 1965.
BALDWIN Bay Minette	F. C. Turner, B.S., 1938, 1965; W. H. Johnson, B.S., 1934, 1965; Donald Eugene Dunn, B.S., 1962, 1965; Edward J. Coats, B.S., Western Kentucky State University; M.S., 1966. Mary C. Silvey, B.S., 1955, 1965; Eugenia Small, B.S., 1937, 1965; Helen V. Norris, B.S., University of Montevallo, 1969.
BARBOUR Clayton	J. W. Walton, B.S., 1946, 1965; Jerry L. Brown, B.S., 1967; William H. Lindsey, B.S., Tuskegee Institute, 1966. Marilyn Dees Bennett, B.S., 1964, 1965; Tommie W. Clark, B.S., Tuskegee Institute, 1940, 1965; Teresa Ann Zeladonis, B.S., University of Montevallo, 1970.
BIBB Centreville	Loyd P. Owens, B.S., M.Ag., 1954, 1971; T. W. Camp, B.S., 1951-1965. Jane Dowdle, B.S., University of Alabama, 1967, 1969; Donna Miller, B.S., 1969.
BLOUNT Oneonta	D. S. Loyd, B.S., M.Ag., 1942, 1965; James O. Conway, B.S., M.Ed., 1967; L. C. McCall, B.S., 1955, 1965. Mildred Gilbert, B.S., M. of H. Ec., 1944, 1965; Sandra N. Owens, B.S., Florence State University, 1970.
BULLOCK Union Springs	W. E. Stone, B.S., M.Ag., 1947, 1965; Henry M. Brooks, B.S., M.Ed., Tuskegee Institute, 1967; James M. Kilgore, B.S., 1970. Carolyn Henderson, B.S., 1941, 1965; Nannie S. Rhodes, B.S., Southern University, 1959, 1965.
BUTLER Greenville	F. H. Morgan, B.S., M.Ag., 1946, 1965; J. P. Moore, B.S., M.Ag., 1953, 1965; Jacob H. Ross, B.S., Tuskegee Institute, M.A., Michigan State University, 1950, 1965; R. C. Thompson, B.S., 1954, 1965.

- Laurine Howell, B.S., University of Alabama, 1949, 1965; Marie E. Crenshaw, B.S., Tuskegee Institute, 1967.
- CALHOUN**
Anniston A. S. Matthews, B.S., 1941, 1965; Goode Nelson, B.A., University of Alabama, 1945, 1965; L. G. Pair, B.S., M.Ag., 1948, 1965; John D. Sellers, B.S., 1949, 1966.
Barbara K. White, B.A., University of Mississippi, 1966, 1970; Georgia Lou P. Aycock, B.S., 1970; Peggy Sue Dean, B.S., 1967; Clemmie Mae Martin, B.S., Tuskegee Institute, 1970.
- CHAMBERS**
LaFayette Howard A. Taylor, B.S., M.Ag.Ed., 1962, 1967; Larry D. Easterwood, B.S., 1961, 1965; Willie Lawson, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1947, 1965; E. L. Stewart, B.S., M.S., 1944, 1967.
Exa Till, B.S., 1946, 1965; Mary Frances Griggs, B.S., Alabama A&M University, 1952, 1965; Ruth Walls, B.S., University of Montevallo, 1969.
- CHEROKEE**
Centre Howard D. Hall, B.S., M.Ag., 1962, 1970; J. B. Butler, B.S., 1954, 1967; Charles R. Moody, B.S., 1964, 1965.
Geneva Marshall James, B.S., 1941, 1965; Irene J. Lackey, B.S., 1965, 1967.
- CHILTON**
Clanton W. R. Futral, B.S., M.Ag., 1959, 1965; Joseph Dale Lowry, B.S., 1969; D. R. Mims, B.S., 1953, 1965.
Mrs. Johnnie Lane, A.B., Judson College, 1952, 1965; Sarah Hickman McDowell, B.S., University of Montevallo, 1967.
- CHOCTAW**
Butler Mathew Sexton, B.S., 1937, 1965; Joseph T. Banks, B.S., M.Ed., Tuskegee Institute, 1947, 1965; R. B. Deavours, B.S., 1946, 1965.
Grace M. Prince, B.S., 1951, 1965; Dale B. Dawkins, B.S., University of Alabama, 1967; Gladys A. Horn, B.S., Tuskegee Institute, 1950, 1965.
- CLARKE**
Grove Hill O. C. Helms, B.S., 1930, 1965; Michael A. Davis, B.S., 1970; Sara G. Alexander, B.S., Mississippi State College for Women, 1967; Joe Ann Arthur, B.S., University of Southern Mississippi, 1967.
- CLAY**
Ashland W. H. Cowan, B.S., 1936, 1965;
Tom F. Farrow, B.S., 1970.
Dora-grace Smith, B.S., University of Montevallo, 1952, 1965; Julie Jones Miller, B.S., University of Montevallo, 1969.
- CLEBURNE**
Heflin W. J. Thompson, B.S., 1954, 1971; E. C. Farrington, B.S., 1941, 1965.
Annie Rae Milner, B.S., University of Montevallo, 1941, 1965; Judith Fennell, B.S., 1970.
- COFFEE**
Enterprise T. C. Casaday, B.S., M.Ag., 1949, 1965; Dan J. Presley, B.S., M.Ag., 1964, 1966; J. R. Speed, 1943, 1965.
Sarah Hutchinson, B.S., Howard College, M.S., 1956, 1965; Virginia E. Greene, B.S., M.S., 1964, 1965.
- COLBERT**
Tuscumbia D. G. Somerville, B.S., 1939, 1965; Dallas Holloway, Jr., B.S., 1964, 1965; Harold Eugene Rose, B.S., 1961; Daniel R. Salter, B.S., M.S., Tuskegee Institute, 1949, 1965.
Christa Hall, B.S., University of Alabama, 1950, 1965; Mary Ann Britton, B.S., Florence State University, 1970.
- CONECUH**
Evergreen M. H. Huggins, B.S., 1936, 1965; George W. Jackson, B.S., M.S., Tuskegee Institute, 1966; H. J. Oakley, B.S., 1954, 1965.
Louise T. Ostrum, B.S., M.Ed., 1957, 1965; Hazel H. Harpe, B.A., Judson College, 1961, 1965.
- COOSA**
Rockford G. S. Sessions, B.S., M.Ag.Ed., 1955, 1965; Elmer Dowdell, B.S., Alcorn A&M College; M.S., Tuskegee Institute, 1957, 1965; Jerry Walls, B.S., 1963, 1965.
Mariah B. Brymer, B.S., M.Ed., Tuskegee Institute, 1963, 1965; Thelma D. Davis, B.S., 1970; Linda W. Meadows, B.S., Samford University; M.Ed., 1969.

- COVINGTON**
Andalusia W. H. Kinard, B.S., M.Ag., 1954, 1965; Robert E. Linder, B.S., M.Ag., 1960, 1965; C. W. Pike, B.S., M.Ag., 1952, 1965; Howard O. Summerford, Jr., B.S., 1970.
Mary Ellen Haynes, B.S., University of Montevallo, 1951, 1965; Barbara W. Becknell, B.S., M.S., University of Alabama, 1970; Ann T. Martin, B.S., University of Alabama, 1966.
- CRENSHAW**
Luverne Ted B. Smith, B.S., M.S., Troy State University, 1963, 1969; G. B. Handley, B.S., 1948, 1965.
Eunice Prater King, B.S., University of Montevallo, 1953, 1965; Annie B. Effinger, B.S., University of Alabama, 1971.
- CULLMAN**
Cullman Bob Eugene Spears, B.S., Oklahoma State University; M.S., University of Tennessee, 1964, 1971; Billy Ray Baswell, B.S., 1966, 1968; Claude L. Dorminey, B.S., University of Georgia, 1967; M.T. Whisenant, B.S., 1949, 1965.
- DALE**
Ozark T. G. Hubbard, B.S., M.Ag., 1936, 1970; James H. Estes, B.S., M.Ag., 1963, 1965; Rodger E. Tindel, B.S., 1970.
Ruth Sundberg, B.S., M.S., University of Tennessee, 1941, 1965; Patsy M. White, B.S., 1970.
- DALLAS**
Selma L. C. Alsobrook, B.S., 1942, 1965; Alex C. Brown, B.S., Tuskegee Institute; M.S., Indiana University, 1959, 1965; James S. Hines, B.S., M.Ed., 1966; George C. Hoopes, B.S., 1963, 1967; Charles D. Scott, II, B.S., M.Ed., Tuskegee Institute, 1951, 1965.
Dorothy Hixson, B.S., University of Montevallo, M.S., University of Tennessee, 1937, 1965; Carolyn L. Hicks, B.S., Tuskegee Institute, 1967; Norma M. McCrory, B.S., University of Southern Mississippi, 1961, 1965.
- DeKALB**
Ft. Payne F. DeWitt Robinson, B.S., 1949, 1965; D.C. Poe, B.S., 1956, 1965; William J. Alverson, B.S., 1965; Danny Wakefield, B.S., 1970.
Mary Louise Walker, B.S., Peabody College, 1954, 1965; Edith A. Barnes, B.S., Bob Jones University, 1967.
- ELMORE**
Wetumpka J. E. Morriss, B.S., M.S., 1935, 1965; W. E. Davis, B.S., M.S., 1959, 1965; L. Shelton Hawsey, B.S., M.Ed., 1965; Roscoe A. Lee, B.S., M.Ed., Tuskegee Institute, 1947, 1965.
LeJean Ford, B.S., Texas State University for Women, 1963, 1967; Judith N. Brown, B.S., 1966; Gwendolyn E. Turner, B.S., Alabama A&M University, 1968. Doris Welch, B.S., Jacksonville State University, 1969.
- ESCAMBIA**
Brewton R. J. Martin, B.S., 1946, 1966; Edward M. Knowles, B.S., M.Ag., 1953, 1965; Barry E. Wood, B.S., 1966, 1967.
Peggy Bracken, B.S., 1963, 1965; Linda C. Greer, B.S., M.S., Mississippi State College for Women.
- ETOWAH**
Gadsden T. L. Sanderson, B.S., M.S., 1943, 1965; H. J. Jackson, B.S., University of Georgia, 1944, 1965; A.D. Jones, B.S., M.Ag., 1948, 1965.
Sara L. Thomas, B.S., 1947, 1965, Maud J. Hill, B.S., Tuskegee Institute, 1971; Celeste H. Martin, B.S., M.S., 1957, 1965; Elois D. Ogletree, B.S., Alabama A&M University; M.A.T., Indiana University.
- FAYETTE**
Fayette James Pettus Tucker, B.S., M.Ag., 1961, 1970; Dwight R. Williams, B.S., 1970.
Annie Mary Hester, B.S., Berry College; M.S., University of Alabama, 1953, 1965; Ina Jan Killingsworth, B.S., 1970.
- FRANKLIN**
Russellville H. A. Ponder, B.S., 1935, 1965; Ellis Raphord Farrington, B.S., 1964, 1965; H. W. Warren, B.S., 1945, 1965.
Joyce McNutt, B.S., 1954, 1965; Wanda Gail Sartin, B.S., Florence State University, 1970.
- GENEVA**
Geneva R. C. Reynolds, B.S., M.Ag.Ed., 1954, 1965; Dan A. Gary, B.S., 1969. Sam D. Carroll, B.S., M.Ed., 1963, 1969.

- Emily H. Seay, B.S., University of Montevallo, 1960, 1965; Marion Ward Dukes, B.S., University of Montevallo, 1970.
- GREENE**
Eutaw W. H. Johnson, B.S., 1935, 1965; Frank L. Jackson, B.S., M.Ed., Tuskegee Institute, 1941, 1965; Jerry L. Williams, B.S., 1967, 1969. Evelyn Blackmon, B.S., Alabama A&M University, 1965.
- HALE**
Greensboro J. B. Deavours, B.S., 1937, 1965; Gwinn Russell Ezell, B.S., Alabama A&M University, 1962, 1965; J. N. Glass, B.S., M.Ag., 1948, 1965; Lee Grant Gober, B.S., M.Ag., 1960, 1967. Evelyn D. Edwards, B.S., M.S., University of Alabama, 1966; Katie I. Carlton, B.S., Tuskegee Institute, 1950, 1965; Amanda Williams, B.S., University of Montevallo, 1969.
- HENRY**
Abbeville R. C. Hartzog, B.S., 1946, 1965; C. L. Barefield, B.S., 1951, 1965; Louis A. Murray, B.S., Alabama A&M University, 1962, 1965. Margaret O. Eason Kirkland, B.S., Jacksonville State University; M. of H. Eco., 1961, 1965; Rossie T. Farmer, B.S., Langston University, 1967; Jewel W. Hardwick, B.S., 1958, 1967.
- HOUSTON**
Dothan Allen M. Mathews, B.S., M.Ag., 1957, 1965; William W. Curtis, B.S., M.Ed., 1963, 1967; Frederick Doss, B.S., 1970; Marion H. Roney, B.S., 1962, 1965; Reafield Vester, B.S., Alabama A&M University, 1966. Julia Smith, B.S., 1955, 1965; Mildred Mae Ward, M.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1955, 1965.
- JACKSON**
Scottsboro B. T. Richardson, B.S., 1945, 1968; Lesel A. Dozier, B.S., M.Ed., 1964, 1965; James H. Pitts, B.S., M.S., Mississippi State University, 1955, 1969. Mrs. Clyde Peck, B.S., 1942, 1965; Betty D. Moore, B.S., 1963, 1969.
- JEFFERSON**
Birmingham C. H. Johns, B.S., 1937, 1965; Hiram N. McCall, B.S., 1970; Charles E. Smith, B.S., 1966, 1967; William Gaines Smith, B.S., 1965; Percy L. White, B.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1949, 1965; David W. Bradford, B.S., 1969; Margaret Whatley, B.S., M.S., University of Alabama, 1941, 1969; Catherine F. Bragg, B.S., University of Alabama, 1964, 1970. Rubye J. Robinson, B.S., Philander Smith College, 1945, 1965; Elsie Jo Scott, B.S., M.Ed., 1970; Elizabeth Simpson, B.S., University of Alabama, 1969; Helen T. Wilson, B.S., Alabama A&M University, 1970.
- LAMAR**
Vernon H. H. Lumpkin, B.S., 1950, 1965; C. T. Guthrie, B.S., 1966. Barbara Alawine, B.S., University of Alabama, 1953, 1965; Janice C. Boykin, B.S., Jacksonville State University, 1970.
- LAUDERDALE**
Florence L. T. Wagnon, B.S., 1935, 1965; Charles W. Burns, B.S., M.Ag., 1957, 1965; Jack S. Butler, B.S., 1970; Irby J. Harrell, B.S., Berry College, 1963, 1965; Robert T. Hughes, B.S., Alabama A&M University; M.S., Tuskegee Institute, 1958, 1965. Sara F. Conner, B.S., University of Montevallo, 1949, 1965; Sadie L. McClellan, B.S., Tuskegee Institute, 1944, 1965; Carlene E. Tenpenny, B.S., Middle Tennessee State University, 1967.
- LAWRENCE**
Moulton S. P. McClendon, B.S., 1943, 1965; Henry J. Buchanan, B.S., Alabama A&M University, 1970; Dean Parris, B.S., M.Ag., 1959, 1965; James E. Pinion, B.S., 1966, 1970. Ruby Rogers, B.S., Athens College, 1953, 1965; Martha H. Pool, B.S., Jacksonville State University, 1966, 1969; Inez M. Petty, B.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1949, 1965.
- LEE**
Opelika R. W. Teague, B.S., 1948, 1965; Richard Dyar, B.S., 1971; Paul Henry Waddy, B.S., Alabama A&M University, 1964, 1965. Elisabeth Crum, B.S., 1955, 1965; Willie C. Lockhart, B.S., Tuskegee Institute, 1937, 1965; Susan B. Wetherington, B.S., University of Georgia, 1970.
- LIMESTONE**
Athens F. K. Agee, B.S., 1945, 1965; Sidney H. Bates, B.S., Tuskegee Institute, 1957, 1969; Watkins L. Carter, B.S., Mississippi State University,

sity, 1967; F. Macon Patterson, B.S., 1954, 1968.

Emma Jo Lindsey, B.S., 1948, 1965; Athelstine H. Malone, B.S., Alabama A&M University, 1956, 1965; Charlotte Marshall, B.S., Jacksonville State University, 1965, 1966.

LOWNDES
Hayneville

Tom J. Gerald, B.S., M.Ag., 1946, 1969; Scott Billingsley, B.S., M.S., Tuskegee Institute, 1951, 1965; William T. Turner, B.S., 1970.
Mary Maddux, B.S., 1957, 1965; Olean P. Cunningham, B.S., Tuskegee Institute, 1950, 1965.

MACON
Tuskegee

J. M. Bolling, B.S., 1939, 1965; James Boyd, B.S., Alabama A&M University, 1971; Leonard Huffman, B.S., M.Ed., Tuskegee Institute, 1962, 1965; William D. Osborn, B.S., 1966.
Carolyn Brown Williams, B.S., Tuskegee Institute, 1962, 1968.
Sonya B. Kelley, B.S., University of Alabama, 1970.

MADISON
Huntsville

R. O. Magnusson, B.S., 1948, 1965; Earl C. Halla, B.S., M.Ag., 1953, 1965; Robert Burton, B.S., Alabama A&M University, 1962, 1969; Lee R. Watkins, B.S., 1967.
Christine Huber, B.S., Peabody College, 1944, 1965; Jane M. Call, B.S., University of Tennessee; Jacquelyn B. Outlaw, B.S., Tuskegee Institute, 1968; Clarence Teague, B.S., Alabama A&M University, 1970.

MARENGO
Linden

Cecil Miller, B.S., M.Ag., 1954, 1968; Charles S. Foreman, B.S., M.Ed., Tuskegee Institute, 1945, 1965; Rudy P. Yates, B.S., 1960.
Marjorie Weaver, B.S., 1943, 1965; Rosalyn Ketchum Palmer, B.S., 1960, 1965; Vera J. Wilson, B.S., Alabama A&M University, 1966.

MARION
Hamilton

H. B. Price, B.S., 1945, 1965; Lathan D. Hooks, B.S., 1971; I. D. Thornton, B.S., M.S., 1944, 1965.
Elna Tanner, B.S., M.S., University of Tennessee, 1950, 1965; Jane Tucker Phillips, B.S., Florence State University, 1967.

MARSHALL
Guntersville

W. L. Martin, B.S., 1942, 1965; R. I. D. Murphy, B.S., M.Ag., 1958, 1965; Franklin H. Wood, B.S., M.Ag., 1963, 1965.
Maxine Johnson, B.S., Florence State University, 1967, 1970; Joyce M. Morgan, B.S., Florence State University, 1970.

MOBILE
Mobile

Charles B. Vickery, B.S., 1948, 1965; W. L. Deakle, 1943, 1965; Charles H. Kilpatrick, B.S., 1964, 1965; Steve Wilson, B.S., 1970.
Mona Whatley, B.S., Peabody College, 1941, 1965; Myra N. Barton, B.S., University of Montevallo, 1968; Carol M. O'Cain, B.S., University of Southern Mississippi, 1970; Mildred Payne, B.S., 1941, 1965; Evelyn Stokes, B.S., Tuskegee Institute, 1970.

MONROE
Monroeville

A. V. Culpepper, B.S., 1928, 1965; Mike M. Gamble, B.S., Mississippi State University, 1966; Walter C. Odom, B.S., Tuskegee Institute; M.S., University of Wisconsin, 1938, 1965; James H. Sellers, B.S., 1966.
Annie Richardson, A.B., Judson College, 1952, 1965; DeLois Carmichael, B.S., M.Ed., Tuskegee Institute, 1952, 1965; Lois Annette Johnson, University of Southern Mississippi, 1967.

MONTGOMERY
Montgomery

T. P. McCabe, B.S., M.Ag., 1939, 1965; Leonard E. Brown, B.S., Alcorn A&M College; M.S., Tuskegee Institute, 1964, 1965; Addre Bryant, B.S., Tuskegee Institute, 1954, 1965; William D. Eubanks, B.S., 1970; Jack A. Thompson, B.S., M.S., University of Tennessee, 1957, 1965.
Virginia Gilchrist, B.S., University of Alabama; M.S., 1955, 1965; Annie M. Boynton, 1928, 1965; Margaret A. Ortega, B.S., 1970; Elizabeth S. Stough, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1945, 1970; Glenda S. Trotter, B.S., University of Kentucky, 1970.

MORGAN
Hartselle

C. D. Rutledge, B.S., M.Ag., 1948, 1965; Eddie E. Cannon, B.S., Alabama A&M University; M.S., Tuskegee Institute, 1965; H. W. Houston, B.S., M.Ag., 1954, 1965; Jerry L. Parker, B.S., M.Ed., 1960, 1965.

- Lucile Hawkins, B.S., University of Montevallo, 1948, 1965; Mary O. Coffey, A.B., Judson College, 1961, 1965; Elouise Lipscomb, 1944, 1965.
- PERRY**
Marion W. O. Hairston, B.S., M.Ag., 1946, 1965; J. A. Bates, B.S., 1950, 1965; Richard E. Smith, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1962, 1965.
Evelyn Graham, B.S., University of Alabama, 1950, 1965; Dorothy A. Piner, B.S., Alabama A&M University, 1970; Joyce Richardson, B.S., Judson College, 1958, 1965.
- PICKENS**
Carrollton Edward N. Graham, B.S., M.S., Mississippi State University, 1960, 1966; Thomas J. Dill, B.S., M.S., Mississippi State University, 1962, 1965; Walter D. Powers, B.S., 1966.
Helen B. Hill, B.S., University of Montevallo; M.S., University of Alabama, 1941, 1965; Lorraine Meeks, B.S., University of Alabama, 1957, 1965.
- PIKE**
Troy H. J. Carter, B.S., 1935, 1965; Darell P. Dunn, B.S., M.Ed., 1965; James McLean, B.S., M.Ag.Ed., 1954, 1967.
Florence Owens, B.S., Florida State University, 1958, 1965; Aris K. D'Andrea, B.S., M.S., University of Southern Mississippi, 1969.
- RANDOLPH**
Wedowee Grady M. Wakefield, B.S., M.Ag.Ed., 1957, 1965; T. F. Burnside, Jr., B.S., M.Ed., 1960, 1965; Theodore Shumpert, B.S., M.Ed., Tuskegee Institute, 1946, 1965.
Elaine Evans, Jacksonville State University, 1969, 1970; Paula J. Morrison, B.S., Jacksonville State University, 1970.
- RUSSELL**
Phenix City C. A. Woods, B.S., 1947, 1965; Donald M. Bice, B.S., Agr., B.S., Ag.Ed., 1970; Mack H. Eldridge, B.S., Virginia State College, 1948, 1965.
Betty J. Wilson, B.S., 1971; Elnora Gandy, B.S., Tuskegee Institute, 1952, 1965.
- SHELBY**
Columbiana W. M. Clark, B.S., 1937, 1965; J. E. Jones, B.S., 1958, 1965.
Marion Cotney, B.S., 1939, 1965; Peggy Prucnal, B.S., Jacksonville State University, 1969.
- ST. CLAIR**
Pell City H. L. Eubanks, B.S., 1934, 1965; W. D. Jackson, B.S., 1946, 1965; J. E. Yates, B.S., 1955, 1965.
Aileen Puckett, B.S., M.S., University of Alabama, 1957, 1965; Louise S. Littlejohn, B.S., University of Alabama, 1967.
- SUMTER**
Livingston B. B. Williamson, B.S., M.Ag., 1946, 1966; F. W. Kilgore, B.S., 1954, 1965; Joe E. Lashley, B.S., M.Ag., 1965; Henry J. Spears, B.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1946, 1965.
Mildred Ennis, B.S., University of Tennessee, 1958, 1965; Gloria R. Steinhilbes, B.S., University of Montevallo, 1970; Theresa E. Threadgill, B.S., Tuskegee Institute, 1957, 1965.
- TALLADEGA**
Talladega Thomas L. Bass, B.S., M.Ed., 1946, 1966; A. A. Hester, B.S., 1944, 1965; J. B. Mathews, B.S., 1949, 1965; Curtis H. O'Daniel, B.S., 1965, 1966; George A. Peasant, B.S., Tuskegee Institute, M.S., Virginia State College, 1950, 1965; Wanda Prater, Jacksonville State University, 1965, 1969.
Marie H. Player, B.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1957, 1965; Sallie A. Taylor, B.S., 1970.
- TALLAPOOSA**
Dadeville C. H. Webb, B.S., 1957, 1965; Jerry G. Hanks, B.S., 1970; James L. McGhee, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1968; R. W. Thompson, B.S., M.Ag.Ed., 1958, 1965.
Margaret Miller, B.S., 1949, 1965; Linda M. Guas, B.S., Louisiana State University, 1969; Annette B. Wallace, B.S., Alabama A&M University, 1966.
- TUSCALOOSA**
Tuscaloosa Albert Pitts, Jr., B.S., M.Ag., 1952, 1970; James Cooper, B.S., 1948, 1965; B. B. Fields, B.S., Tuskegee Institute; M.S., University of

- Illinois, 1954, 1965; James C. Howell, B.S., M.Ag.Ed., 1961, 1965; French Sconyers, B.S., 1943, 1965; Elizabeth Stewart, B.S., M.S., University of Alabama, 1945, 1965; Eula H. Jasper, B.S., Arkansas AM&M College, 1970; Mrs. O'Neal Massey, B.S., M.S., University of Alabama, 1952, 1965; Jo Ann H. Smith, B.S., University of Alabama, 1970; Sarah N. Watson, B.S., M.S., University of Alabama, 1961, 1965.
- WALKER Jasper** Robert E. Thornton, B.S., M.Ag., 1954, 1965; Jerry B. Clark, B.S., M.Ed., 1965; W. D. Jones, B.S., M.Ag., 1954, 1965. Jeanette Argo, B.S., University of Montevallo; M.S., University of Alabama, 1942, 1965; Linda Eason, B.S., University of Alabama, 1969, 1970; Margaret P. Gray, B.S., University of Alabama, 1966; Mary Linda Maughan, B.S., Mississippi State College for Women, 1967.
- WASHINGTON Chatom** D. O. Estes, B.S., 1949, 1965; Thomas E. Fuller, B.S., 1969; Sarah H. Hazen, B.S., 1964, 1965; Patricia Ann Taylor, B.S., University of Alabama, 1968.
- WILCOX Camden** Robert C. Farquhar, B.S., M.S., 1949, 1965; Richard E. Cobb, B.S., Tuskegee Institute, 1950, 1968; W. J. Hardy, B.S., 1954, 1965; Ida Jo Harrison, B.S., University of Montevallo, M.Ed., University of Tennessee, 1970; Solonia E. Reynolds, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1949, 1965.
- WINSTON Double Springs** W. L. Richardson, B.S., 1935, 1965; J. E. Fields, B.S., 1949, 1965.

ENGINEERING EXPERIMENT STATION STAFF

- HARRY M. PHILPOTT, A.B., Ph.D., D.D., LL.D., LL.D., LL.D., *President*
 BEN T. LANHAM, JR., B.S., M.S., Ph.D., *Vice President for Research*
 J. GRADY COX, B.S.Ch.E., M.S., Ph.D., *Director*
 CHARLES H. HOLMES, B.E.E., M.E.E., Ph.D., *Associate Director*
 WILLIAM C. JONSON, JR., B.S., *Assistant Director*

Aerospace Engineering

- PITTS, ROBERT G. *Professor and Head of Department*
 B.A.E., Auburn University; M.S., California Institute of Technology.
- HARWELL, KENNETH E. *Professor, 1963, 1970*
 B.S., University of Alabama; M.S., Ph.D., California Institute of Technology.
- SFORZINI, RICHARD H. *Professor, 1966, 1967*
 B.S., U.S. Military Academy; Degree of Mechanical Engineering, Massachusetts Institute of Technology.
- MARTIN, FRED W. *Professor, 1956*
 B.S.A.E., M.S., Ph.D., Virginia Polytechnic Institute.
- BENNETT, ARTHUR G. *Associate Professor, 1968*
 B.S., University of Michigan; M.S., Ph.D., Purdue University.
- CUTCHINS, MALCOLM A. *Associate Professor, 1956, 1962*
 B.S.C.E., M.S.E.M., Ph.D., Virginia Polytechnic Institute.
- KITELEY, GARY W. *Associate Professor, 1965, 1970*
 B.S., University of Minnesota; M.S., Purdue University; F.A.A., A&P Certificate. Parks College.
- NICHOLS, JAMES O. *Associate Professor, 1960, 1970*
 B.S.A.E., M.S.E., Ph.D., University of Alabama.
- COCHRAN, JOHN E. *Assistant Professor, 1966, 1970*
 B.A.E., M.S.A.E., Auburn University.

Chemical Engineering

- TAYLOR, ZELMA LOWELL, JR. *Associate Professor and Head of Department, 1970*
 B.S.Ch.E., University of Idaho; M.S., Auburn University; Ph.D., University of Florida.

- HSU, CHENG-TEH _____ *Professor, 1953, 1962*
B.S.C., University of Nanking; M.S., University of Wisconsin; Ph.D., University of Pennsylvania.
- WINGARD, ROBERT E. _____ *Professor, 1932, 1969*
B.S., M.S., Auburn University.
- HIRTH, LEO J. _____ *Associate Professor, 1962*
B.S., College of City of New York; M.S., Ph.D., University of Texas.
- VIVES, DONALD LOUIS _____ *Associate Professor, 1953, 1957*
B.S., M.S., Columbia University.
- ASKEW, WILLIAM C. _____ *Assistant Professor, 1969*
B.S., M.S., Auburn University; Ph.D., University of Florida.
- GUIN, JAMES A. _____ *Assistant Professor, 1970*
B.S.Ch.E., M.S.Ch.E., University of Alabama; Ph.D., University of Texas.

Civil Engineering

- RAINER, REX K. _____ *Professor and Head of Department, 1962, 1968*
B.C.E., M.C.E., Auburn University; Ph.D., Oklahoma State University.
- BRANSFORD, THOMAS L. _____ *Professor, 1965*
B.E., C.E., Vanderbilt University.
- HUDSON, FRED K. _____ *Professor, 1947, 1961*
B.S.C.E., Purdue University; M.S., Princeton University.
- KRISHNAMURTHY, N. _____ *Associate Professor, 1967*
Intermediate in Science, St. Joseph's College, Bangalore, India; B.Sc., Central College, Bangalore, India; B.E. (Civil), National Institute of Engineering, Mysore, India; M.S. (CE), Ph.D., University of Colorado.
- JUDKINS, JOSEPH F., JR. _____ *Gottlieb Associate Professor, 1967, 1971*
B.S.C.E., M.S.E.E., Ph.D., Virginia Polytechnic Institute.
- HARRISON, CARTER H., JR. _____ *Assistant Professor, 1970*
B.S., Petroleum Engineering, M.S.C.E., Engineer, Stanford University.
- KRAFT, LELAND M., JR. _____ *Assistant Professor, 1969*
B.C.E., M.S., Ph.D., Ohio State University.
- MOLZ, FRED J., III _____ *Assistant Professor, 1970*
B.S. Physics, M.S.C.E., Drexel University; Ph.D., Stanford University.
- MOORE, RAYMOND K. _____ *Assistant Professor, 1971*
B.S.C.E., M.S., Oklahoma State University; Ph.D., University of Texas.
- MORGAN, JOE M. _____ *Assistant Professor, 1971*
B.S.C.E., Tennessee Technological University; M.S., Ph.D., Virginia Polytechnic Institute and State University.

Electrical Engineering

- CARROLL, CHESTER C. _____ *Professor and Head of Department, 1965, 1969*
B.S.E.E., M.S.E.E., Ph.D., University of Alabama.
- GRAF, EDWARD R. _____ *Professor, 1957, 1967*
B.E.E., M.E.E., Auburn University; Ph.D., Technische Hochschule, Stuttgart.
- HONNELL, MARTIAL A. _____ *Professor, 1958*
B.S.E.E., M.S.E.E., E.E., Georgia Institute of Technology.
- LOWRY, JAMES L. _____ *Professor, 1955, 1965*
B.E.E., M.E.E., Auburn University; Ph.D., University of Florida.
- PHILLIPS, CHARLES L. _____ *Professor, 1959, 1965*
B.E.E., M.S.E.E., Ph.D., Georgia Institute of Technology.
- HICKMAN, CHARLES E. _____ *Associate Professor, 1966*
B.S.E.E., M.S.E.E., Ph.D., University of Tennessee.
- NICHOLS, GROVER T. _____ *Associate Professor, 1947, 1950*
B.E.E., Auburn University; M.S., Georgia Institute of Technology.
- ROGERS, CHARLES L. _____ *Associate Professor, 1961, 1969*
B.E.E., M.S., Auburn University; Ph.D., Duke University.
- SLAGH, TIM D. _____ *Associate Professor, 1958, 1965*
B.S., Michigan College of Mining and Technology; M.S., Auburn University.
- ALBRITTON, WILLIAM P., JR. _____ *Assistant Professor, 1971*
B.S.E.E., M.S.E.E., Auburn University; Ph.D., University of Tennessee.
- BOLAND, JOSEPH S., III _____ *Assistant Professor, 1961, 1968*
B.S.E.E., M.S.E.E., Auburn University; Ph.D., Georgia Institute of Technology.

- CARROLL, BILLY D. _____ Assistant Professor, 1970
B.S.E.E., M.S.E.E., Ph.D., University of Texas.
- IRWIN, J. DAVID _____ Assistant Professor, 1969
B.E.E., Auburn University; M.S.E.E., Ph.D., University of Tennessee.
- JAMES, SYDNEY N. _____ Assistant Professor, 1966
B.S.E.E., M.S.E.E., Ph.D., University of Alabama.
- NAGLE, H. TROY _____ Assistant Professor, 1966, 1970
B.S.E.E., M.S.E.E., University of Alabama; Ph.D., Auburn University.
- AMOSS, JOHN W. _____ Instructor, 1964, 1969
B.E.E., Auburn University; M.S.E.E., Georgia Institute of Technology.
- CARTER, MARION B. _____ Instructor, 1967
B.S., M.S., University of Tennessee.
- HEATH, JAMES R. _____ Research Associate, 1968, 1971
B.S.E.E., M.S.E.E., Auburn University.
- IRVING, THURMAN A., JR. _____ Research Associate, 1968, 1971
B.S., Mississippi State University; M.S., Auburn University.
- SANDERLIN, JAMES C. _____ Research Associate, 1962, 1970
B.S.E.E., M.S.E.E., Auburn University.

Industrial Engineering

- BROOKS, GEORGE H. _____ Professor and Head of Department, 1966
B.I.E., Florida State University; M.S.I.E., Ph.D., Georgia Institute of Technology.
- DENHOLM, DONALD H. _____ Professor, 1968
B.S., Pennsylvania State University; M.S., Washington University.
- MORGAN, WILLIAM W. _____ Associate Professor, 1954, 1965
B.B.A., University of Georgia; M.S.I.M., Georgia Institute of Technology.
- SMITH, LEO ANTHONY _____ Assistant Professor, 1969
B.S.I.E., M.S.I.E., Georgia Institute of Technology; Ph.D., Purdue University.
- TRUCKS, LOUIS B. _____ Assistant Professor, 1964
B.S., Auburn University; M.S., University of Pittsburgh.
- ZALOOM, VICTOR ANTHONY _____ Assistant Professor, 1970
B.S.I.E., M.S.I.E., University of Florida; Ph.D., University of Houston.

Mechanical Engineering

- VESTAL, DONALD M., JR. _____ Professor and Head of Department, 1959
B.S.M.E., B.S.E.E., M.S.M.E. Texas A&M University; Ph.D., Stanford University.
- BUSSELL, WILLIAM H. _____ Professor, 1965
B.M.E., M.S.E., University of Florida; Ph.D., Michigan State University.
- JEMIAN, WARTAN A. _____ Professor, 1962, 1965
B.S.Ch., University of Maryland; M.S., Ph.D., Metallurgical Engineering, Rensselaer Polytechnic Institute.
- JONES, EDWARD O., JR. _____ Professor and Assistant Head Professor, 1946, 1965
B.M.E., B.E.E., Auburn University; M.S., University of Illinois.
- MAYNOR, HAL W. _____ Professor, 1959
B.S., M.S., D. of Engineering, University of Kentucky.
- SHAW, WINFRED A. _____ Professor, 1958
B.S.G.E., University of Mississippi; M.S.E.M., University of Texas; Ph.D., Stanford University.
- SWINSON, WELDON F. _____ Professor, 1964, 1967
B.A., Rice University; B.S.M.E., Texas Technological College; M.S.M.E., Texas A&M University; Ph.D., University of Illinois.
- TANGER, GERALD E. _____ Professor, 1958, 1960
B.S., M.S., South Dakota School of Mines and Technology; Ph.D., Oklahoma State University.
- VACHON, REGINALD I. _____ Alumni Professor, 1958, 1967
B.M.E., M.S.N.S., Auburn University; Ph.D., Oklahoma State University.
- DYER, DAVID F. _____ Associate Professor, 1969
B.S.M.E., University of Tennessee; M.S.M.E., Ph.D., Georgia Institute of Technology.
- FLUKER, BILLIE J. _____ Associate Professor, 1960
B.S.E.E., M.S.M.E., Texas A&M University; Ph.D., Tulane University.
- LEPPERT, ALFRED M. _____ Associate Professor, 1965
B.M.E., Georgia Institute of Technology; M.S., Stanford University.
- MAPLES, GLENNON _____ Associate Professor, 1966
B.S., M.S., Mississippi State University; Ph.D., Oklahoma State University.

- WILCOX, ROY C. *Associate Professor, 1969*
B.S., M.S., Virginia Polytechnic Institute; Ph.D., University of Missouri.
- YU, JAMES C. M. *Associate Professor, 1963, 1967*
B.S., National Taiwan University; M.S., Virginia Polytechnic Institute; Ph.D., Auburn University.
- DUNN, JERRY R. *Assistant Professor, 1966*
B.S., Lamar State College of Technology; M.S.M.E., Georgia Institute of Technology.
- GOODLING, JOHN S. *Assistant Professor, 1968*
B.S.M.E., M.S.M.E., Ph.D., University of Florida.
- RANSON, WILLIAM F., III *Assistant Professor, 1962, 1971*
B.S.M.E., M.S.M.E., Auburn University; Ph.D., University of Illinois.

Textile Engineering

- ADAMS, CLEVELAND L. *Professor and Head of Department, 1952*
B.T.E., Auburn University.
- WATERS, WILLIAM T. *Professor, 1958, 1963*
B.S.T.E., Clemson University; M.S., Georgia Institute of Technology.
- FARROW, JAMES C. *Associate Professor, 1949, 1965*
B.S.T.E., Auburn University.
- HALL, DAVID M. *Associate Professor, 1965*
B.T.C., Auburn University; M.S.T.C., Clemson University; Ph.D., Victoria University (England).
- MORTON, GLENN P. *Assistant Professor, 1967*
B.S., McMurry College; M.S., Auburn University.
- PERKINS, WARREN S. *Assistant Professor, 1969, 1970*
B.S.T.C., M.S.T.C., Clemson University.
- WALKER, ROBERT P. *Assistant Professor, 1968*
B.S.T.M., Auburn University; M.S., Institute of Textile Technology.

ENGINEERING EXTENSION SERVICE

- HARRY M. PHILPOTT, A.B., Ph.D., D.D., LL.D., LL.D., LL.D., *President*
FRED R. ROBERTSON, JR., B.S., M.S., Dr.P.A., *Vice President for Extension*
J. GRADY COX, B.S.Ch.E., M.S., Ph.D., *Dean, School of Engineering and Director*
JAMES F. O'BRIEN, JR., B.M.E., M.M.E., *Assistant Director*
WILLIAM B. SANFORD, B.M.E., M.M.E., *Director, Birmingham Office*
BILLY R. MANNING, B.S., *Director, Civil Defense Professional Advisory Center*
OLAN A. HEMBREE, *Administrative Assistant*

Aerospace Engineering

- PITTS, ROBERT GILES *Professor and Head, 1935, 1944*
B.A.E., Auburn University; M.S., California Institute of Technology.
- MARTIN, FRED W. *Professor, 1956*
B.S.A.E., M.S., Ph.D., Virginia Polytechnic Institute.
- SFORZINI, RICHARD H. *Professor, 1966*
B.S., United States Military Academy; Degree of Mechanical Engineer, Massachusetts Institute of Technology.
- CUTCHINS, MALCOLM A. *Associate Professor, 1966, 1968*
B.S.C.E., M.S.E.M., Ph.D., Virginia Polytechnic Institute.
- DECKER, HAROLD R. *Associate Professor, 1965*
B.S.Ed., Northeast Missouri State Teachers College; M.Litt., University of Pittsburgh.
- KITELEY, GARY W. *Associate Professor, 1965*
B.S., University of Minnesota; M.S., Purdue University; F.A.A., A&P. Certificate, Parks College.
- CALLAN, ALLIE WILLIS, JR. *Assistant Professor, 1968*
B.S., University of Maryland; M.S., George Washington University.

Chemical Engineering

- TAYLOR, ZELMA LOWELL, JR. *Associate Professor and Head of Department, 1962, 1970*
B.S.Ch.E., University of Idaho; M.S., Auburn University; Ph.D., University of Florida.
- HIRTH, LEO J. *Associate Professor, 1962*
B.S., College of City of New York; M.S., Ph.D., University of Texas.
- VIVES, DONALD L. *Associate Professor, 1953, 1968*
B.S., M.S., Columbia University.

- ASKEW, WILLIAM C. *Assistant Professor, 1967*
B.S., M.S., Auburn University; Ph.D., University of Florida.

Civil Engineering

- RAINER, REX KELLY *Professor and Head of Department, 1962, 1968*
B.C.E., M.C.E., Auburn University; Ph.D., Oklahoma State University.
- BRANSFORD, THOMAS L. *Professor, 1965*
B.E., C.E., Vanderbilt University.
- HUDSON, FRED M. *Professor, 1947, 1961*
B.S.C.E., Purdue University; M.S., Princeton University.
- KRISHNAMURTHY, N. *Associate Professor, 1967*
B.Sc., B.E., University of Mysore, India; M.S., Ph.D., University of Colorado.
- JUDKINS, JOSEPH F., JR. *Gottlieb Associate Professor, 1967, 1971*
B.S.C.E., M.S.S.E., Ph.D., Virginia Polytechnic Institute.
- HARRISON, CARTER H., JR. *Assistant Professor, 1970*
B.S., M.S., Engineer, Stanford University.
- KRAFT, LELAND MILO, JR. *Assistant Professor, 1969*
B.C.E., M.S., Ph.D., Ohio State University.
- MOLZ, FRED J., III *Assistant Professor, 1970*
B.S., Physics, M.S.C.E., Drexel University; Ph.D., Stanford University.
- MOORE, RAYMOND K. *Assistant Professor, 1971*
B.S.C.E., M.S., Oklahoma State University; Ph.D., University of Texas.
- HOBART, THOMAS F. *Lecturer, 1971*
B.S.C.E., C.E., Auburn University.

Electrical Engineering

- CARROLL, CHESTER C. *Professor and Head of Department, 1966, 1969*
B.S.E.E., M.S.E.E., Ph.D., University of Alabama.
- GRAF, EDWARD RAYMOND *Professor, 1957, 1967*
B.E.E., M.E.E., Auburn University; Ph.D., University of Stuttgart, Germany.
- LOWRY, JAMES LEE *Professor, 1955, 1965*
B.E.E., M.E.E., Auburn University; Ph.D., University of Florida.
- PHILLIPS, CHARLES L. *Professor, 1959, 1965*
B.E.E., M.S.E.E., Ph.D., Georgia Institute of Technology.
- RUSSELL, DALLAS WILSON *Professor, 1959, 1963*
B.S.E.E., M.S.E.E., University of Tennessee.
- FEASTER, WILLIAM M. *Associate Professor, 1956, 1965*
B.S.E.E., M.S.E.E., Auburn University.
- HICKMAN, CHARLES E. *Associate Professor, 1966*
B.S.E.E., M.S.E.E., Ph.D., University of Tennessee.
- BOLAND, JOSEPH S., III *Assistant Professor, 1961, 1968*
B.S.E.E., M.S.E.E., Auburn University; Ph.D.E.E., Georgia Institute of Technology.
- CARROLL, BILLY D. *Assistant Professor, 1970*
B.S.E.E., M.S.E.E., Ph.D., University of Texas.
- IRWIN, J. DAVID *Assistant Professor, 1969*
B.E.E., Auburn University; M.S.E.E., Ph.D., University of Tennessee.
- NAGLE, H. TROY *Assistant Professor, 1966, 1970*
B.S.E.E., M.S.E.E., University of Alabama; Ph.D., Auburn University.

Industrial Engineering

- BROOKS, GEORGE H. *Professor and Head of Department, 1966*
B.I.E., University of Florida; M.S.I.E., Ph.D., Georgia Institute of Technology.
- DENHOLM, DONALD H. *Professor, 1968*
B.S., Pennsylvania State University; M.S., Washington University.
- MORGAN, WILLIAM W. *Associate Professor, 1954, 1965*
B.B.A., University of Georgia; M.S.I.M., Georgia Institute of Technology.
- SMITH, LEO ANTHONY *Assistant Professor, 1969*
B.S.I.E., M.S.I.E., Georgia Institute of Technology; Ph.D., Purdue University.
- TRUCKS, LOUIS B. *Assistant Professor, 1964*
B.S., Auburn University; M.S., University of Pittsburgh.

Mechanical Engineering

- VESTAL, DONALD M., JR. _____ *Professor and Head of Department, 1959*
B.S.M.E., B.S.E.E., M.S.M.E., Texas A & M University; Ph.D., Stanford University.
- VACHON, REGINALD I. _____ *Alumni Professor, 1958, 1967*
B.M.E., M.S.N.S., Auburn University; Ph.D., Oklahoma State University.
- JEMIAN, WARTAN A. _____ *Professor, 1962, 1965*
B.S.Ch., University of Maryland; M.S., Ph.D., Metallurgical Engineering; Rensselaer Polytechnic Institute.
- JONES, EDWARD O., JR. _____ *Professor, 1946, 1965*
B.M.E., B.E.E., Auburn University; M.S., University of Illinois.
- SWINSON, WELDON FRANK _____ *Alumni Professor, 1964, 1969*
B.A., Rice University; B.S.M.E., Texas Technological College; M.S.M.E., Texas A&M University; Ph.D., University of Illinois.
- TANGER, GERALD _____ *Professor, 1958, 1968*
B.S., South Dakota School of Mines and Technology; M.S., Brown University; Ph.D., Oklahoma State University.
- DYER, DAVID F. _____ *Associate Professor, 1965, 1969*
B.S.M.E., University of Tennessee; M.S.E.E., Ph.D., Georgia Institute of Technology.

Technical Services

- HAYNES, LUTHER J. _____ *Professor and Head of Department, 1945, 1962*
B.S., M.S., Auburn University; Ed.D., Bradley University.
- BLAKNEY, WILLIAM G. G. _____ *Associate Professor, 1958, 1961*
B.E., Nova Scotia Technical College; M.Sc., Ohio State University.

Textile Engineering

- ADAMS, CLEVELAND L. _____ *Professor and Head of Department, 1952*
B.T.E., Auburn University.
- WATERS, WILLIAM T. _____ *Professor, 1958, 1963*
B.S.T.E., Clemson University; M.S., Institute of Textile Technology.
- FARROW, JAMES C. _____ *Associate Professor, 1949, 1965*
B.S.T.E., Auburn University.
- HALL, DAVID M. _____ *Associate Professor, 1965*
B.T.C., Auburn University; M.S.T.C., Clemson University; Ph.D., Victoria University of Manchester, England.
- WALKER, ROBERT P. _____ *Assistant Professor, 1968*
B.S.T.M., Auburn University; M.S., Institute of Textile Technology.

STATE REGULATORY AND VETERINARY SERVICES

STATE REGULATORY SERVICE

CHEMISTRY

GUTHERY, MILFORD DALTON	Chief Chemist III, 1966
B.S., M.S., Auburn University.	
RHOADES, REGINA A.	Agricultural Chemist II, 1961, 1967
B.S., Auburn University.	
HAYES, MELVIN	Agricultural Chemist II, 1966, 1968
B.S., University of West Virginia.	
SHAVER, CHARLES J.	Agricultural Chemist II, 1971
B.S., Erskine College.	
HAYES, ROSE MAE	Agricultural Chemist I, 1967
B.S., Florence State University.	
DAVIDSON, PRISCILLA P.	Agricultural Chemist I, 1968
B.S., M.S., Auburn University.	
JINKS, JOHN D.	Assistant Chemist, 1968
B.S., Auburn University.	
BOULWARE, PAUL	Assistant Chemist, 1970
B.S., M.S., Auburn University.	

STATE VETERINARY DIAGNOSTIC LABORATORY

(Conducted in cooperation with the Alabama State Department of Agriculture and Industries and the United States Department of Agriculture, Agricultural Research Service.)

GREENE, JAMES E.	Dean (School of Veterinary Medicine), 1937, 1958
D.V.M., M.S., Auburn University.	
MILLIGAN, JOHN G.	State Veterinarian, 1951
B.S., D.V.M., Auburn University.	
TAYLOR, JULIAN B.	Associate State Veterinarian, 1945
D.V.M., Auburn University.	
ROBERTS, CHARLES S.	In Charge (State Diagnostic Laboratory), 1947, 1963
D.V.M., Auburn University; M.S., Michigan State University.	
LONG, IRL RICHARD, JR.	Bacteriologist (State Diagnostic Laboratory), 1966
A.B., Huntingdon College.	
NICHOLSON, LINDA	Bacteriologist (State Diagnostic Laboratory), 1968
B.S., University of Alabama.	
CHRISTENBERRY, C. C.	Brucellosis Epidemiologist (U.S. Dept. of Agriculture, Agricultural Research Service, D.V.M.), 1966
EMRICK, V. R.	In Charge of Bang's Disease Laboratory (U.S. Dept. of Agriculture, Agricultural Research Service), 1939
WILLIAMSON, O. B.	U.S. Dept. of Agriculture, Agricultural Research Service, Biological Laboratory Aide, 1955
WILLIAMSON, RUTH	U.S. Dept. of Agriculture, Agricultural Research Service, Biological Laboratory Aide, 1957
POOLE, JAMES H.	In Charge of State Veterinary Diagnostic Laboratory, Albertville, Alabama, 1964
D.V.M., Auburn University.	
MOODY, RICHARD C.	Bacteriologist, State Veterinary Diagnostic Laboratory, Albertville, Alabama, 1971
B.S., Auburn University.	
MCCREARY, V. D.	In Charge of State Veterinary Diagnostic Laboratory, Elba, Alabama, 1960
D.V.M., Auburn University.	
MOODY, HAROLD M.	Bacteriologist, State Veterinary Diagnostic Laboratory, Elba, Alabama, 1955, 1962
B.S., Troy State University.	

SCHOOL AND CURRICULUM

School of Arts and Sciences

Applied Physics (APS)	1	3	4	5	3	3	11	5	1	12
Chemistry (CH)	12	4	53	69	17	8	11	5	4	286
General Curriculum (GC)	160	168								242
Gen. Cur. Art (GAT)										
Gen. Cur. Biological Science (GBI)	19	6	8	4	2	4	9	6	3	41
Gen. Cur. Chemistry (GCH)	2	1	1	1	9	4	4			20
Gen. Cur. Economics (GEC)	1	1			2	16	11	2		96
Gen. Cur. English (GEH)	3	17	9	23	12	23	11	13	1	77
Gen. Cur. Foreign Language (GFL)	1	19	2	13	5	20		8		60
Gen. Cur. Geography (GGV)			4							
Gen. Cur. Geology (GGL)	2				3		1			4
Gen. Cur. History (GHV)	7	9	10	19	19	1	20			6
Gen. Cur. Journalism (GJM)	12	11	9	10	12	11			4	59
Gen. Cur. Mathematics (GMH)	20	34	14	19	26	31	27	7		38
Gen. Cur. Philosophy (GPA)	5		3		5					102
Gen. Cur. Psychology (GPG)	20	35	17	18	19	23	13	10		15
Gen. Cur. Political Science (GPO)	23	7	26	4	17	22	7	7	1	87
Gen. Cur. Physics (GPS)	1		1		2					25
Gen. Cur. Speech Communication (GSC)	10	7	8	8	29	11	12	19	2	4
Gen. Cur. Sociology (GSV)	6	34	6	21	14	38	10	26	1	61
Geology (GL)	7	1	3		8	4				37
Lab Technology (LT)	3	37	4	21	3	18	1	18	1	22
Law Enforcement (LE)	24	6	17	22	22	11	8			95
Mathematics (MH)	6	11	5	3	13	4	11	5	1	74
Physics (PS)	12	2	11	1	13	8	5	23		28
Pre-Dentistry (PD)	36	3	23	1	17	2	10	1	4	42
Pre-Hosp. Admin. (HA)	4		1		1					6
Pre-Law (PL)	113	15	81	5	68	5	45	1		26
Pre-Medicine (PM)	126	23	57	9	96	3	15	5	4	307
Pre-Occupational Therapy (OT)										238
Pre-Optometry (OP)										40
Pre-Pharmacy (PPV)	46	27	44	16	18	1				1
Pre-Physical Therapy (PT)	2	8		1		5			2	49
Pre-Veterinary Medicine (PV)	78	24	43	7	31	5	4		7	12
Psychology (PG)							9	3	1	37
Public Administration (PUB)			1							10
TOTAL UNDERGRADUATE	762	509	472	264	433	240	285	163	32	1,984
GRADUATE SCHOOL TOTAL (Arts & Science)										1,184
TOTAL										2,217
										1,308

SCHOOL AND CURRICULUM

School of Home Economics

Clothing, Textiles and Related Arts (CT)
Child Dev. (FCD)
Family and Child Services (FCS)
Fashion Merchandising (FM)
Home Mgt. and Family Ec. (HME)
Housing and Equipment (HEQ)
Institution Food Mgt. (IFM)
Nursing Science (NS)
Nutrition and Foods (NF)
TOTAL UNDERGRADUATE

School of Pharmacy

Pharmacy (PY)	_____
TOTAL UNDERGRADUATE	_____

School of Veterinary Medicine

Veterinary Medicine (VM) _____
TOTAL UNDERGRADUATE _____

Transients

TOTAL UNDERGRADUATE	2
TOTAL UNDERGRADUATES	2
GRADUATE SCHOOL (Interdepartmental Program in Urban and Regional Planning)	2

	TOTAL GRADUATE SCHOOL	GRAND TOTAL ALL UNIVERSITY

[illegible]

55	18	52	23	45	18	1	153
55	18	52	23	45	18	1	153
55	18	52	23	45	18	1	153
							7
GRADUATE SCHOOL							2
TOTAL (Pharmacy)							61

	98	12	100	7	90	3	97	1	385
	98	12	100	7	90	3	97	1	385
	98	12	100	7	90	3	97	1	385
									23
									23
									1
									24
									404
									GRADUATE SCHOOL
									TOTAL (Veterinary Medicine)

	I	GRADUATE SCHOOL TOTAL (Transients)	13	14	14	14	9	23	23	4,554		
1,343	1,958	1,060	2,125	1,143	2,016	894	166	19	182	95	8,527	4,554

	12	1
923	499	
9,450	5,055	
3,018	2,910	185
3,268	2,777	

TOTAL all Men and Women

**Table II — Enrollment of Alabama Students by Counties
Fall Quarter, 1971**

County	Men	Women	Total
Autauga	58	24	82
Baldwin	118	69	187
Barbour	71	34	105
Bibb	15	10	25
Blount	40	21	61
Bullock	39	11	50
Butler	48	22	70
Calhoun	116	60	176
Chambers	194	93	287
Cherokee	30	7	37
Chilton	41	10	51
Choctaw	16	5	21
Clarke	42	26	68
Clay	41	21	62
Cleburne	15	5	20
Conecuh	83	44	127
Coffee	69	16	85
Colbert	16	15	31
Coosa	40	21	61
Covington	96	65	161
Crenshaw	27	9	36
Cullman	65	26	91
Dale	78	43	121
Dallas	85	57	142
DeKalb	68	34	102
Elmore	96	57	153
Escambia	69	26	95
Etowah	172	97	269
Fayette	18	4	22
Franklin	33	18	51
Geneva	44	32	76
Greene	5	5	10
Hale	18	3	21
Henry	39	20	59
Houston	134	63	197
Jackson	59	19	78
Jefferson	1,098	718	1,816
Lamar	7	0	7
Lauderdale	92	45	137
Lawrence	33	5	38
Lee	1,084	572	1,656
Limestone	38	20	58
Lowndes	26	12	38
Macon	32	32	64
Madison	332	223	555
Marengo	23	19	42
Marion	25	4	29
Marshall	115	53	168
Mobile	268	160	428
Monroe	33	19	52
Montgomery	612	396	1,008
Morgan	132	113	245
Perry	20	7	27
Pickens	24	4	28
Pike	37	21	58
Randolph	77	47	124
Russell	136	51	187
Shelby	33	12	45
St. Clair	54	23	77
Sumter	12	3	15
Talladega	137	61	198
Tallapoosa	179	88	267
Tuscaloosa	51	11	62
Walker	29	18	47
Washington	13	8	21
Wilcox	26	12	38
Winston	16	9	25
TOTAL (Alabama)	6,972	3,858	10,830

Table III — Enrollment of Students by States and Territories
Fall Quarter, 1971

State	Men	Women	Total
Arizona	2	0	2
Arkansas	14	6	20
California	19	5	24
Colorado	4	3	7
Connecticut	3	4	7
Delaware	6	2	8
District of Columbia	1	0	1
Florida	500	262	762
Georgia	798	559	1,357
Hawaii	1	0	1
Idaho	0	1	1
Illinois	15	9	24
Indiana	16	7	23
Iowa	6	1	7
Kansas	5	1	6
Kentucky	92	20	112
Louisiana	64	13	77
Maine	4	1	5
Maryland	44	5	49
Massachusetts	4	1	5
Michigan	7	3	10
Minnesota	5	1	6
Mississippi	127	36	163
Missouri	14	1	15
Montana	3	0	3
Nebraska	3	1	4
New Hampshire	2	1	3
New Jersey	31	7	38
New Mexico	1	0	1
New York	38	12	50
North Carolina	38	18	56
North Dakota	1	0	1
Ohio	34	10	44
Oklahoma	9	7	16
Oregon	2	0	2
Pennsylvania	31	8	39
Rhode Island	3	1	4
South Carolina	48	16	64
South Dakota	3	2	5
Tennessee	210	105	315
Texas	38	16	54
Utah	2	1	3
Virginia	73	25	98
Washington	6	2	8
West Virginia	5	2	7
Wisconsin	6	4	10
TOTAL — Other States	2,338	1,179	3,517
TOTAL — All States	9,310	5,037	14,347
United States Territories			
Canal Zone	5	0	5
Puerto Rico	2	1	3
TOTAL — U.S. Territories	7	1	8

**Table IV — Enrollment of Students by Foreign Country
Fall Quarter, 1971**

Foreign Country	Men	Women	Total
Afghanistan	0	1	1
Australia	1	0	1
Bahamas	1	0	1
Bolivia	1	0	1
Canada	1	0	1
China	42	11	53
Dominican Republic	1	0	1
Egypt	4	0	4
El Salvador	1	0	1
England	2	0	2
Greece	1	0	1
Honduras	2	0	2
Hong Kong	5	0	5
India	24	2	26
Indonesia	1	0	1
Iran	16	0	16
Jordan	4	0	4
Korea	3	0	3
Lebanon	1	1	2
Pakistan	2	0	2
Peru	1	0	1
Philippines	4	0	4
South Africa	1	0	1
Syria	1	0	1
Thailand	9	0	9
Venezuela	4	0	4
TOTAL — Foreign Countries	133	15	148
TOTAL STUDENTS ENROLLED—			
Fall Quarter, 1971	9,450	5,053	14,503

General Summary of Enrollment

Total Enrollment on Auburn Campus	14,503
Correspondence Study	809
Clinics, Conferences, etc.	15,800
Montgomery Center (Credit)	1,543
Montgomery Center (Non-Credit)	305
GRAND TOTAL	32,960

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